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EU-US AIRPLANE SUBSIDY DISPUTES AIRBUS vs. BOEING

By

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It was my privilege to discuss the on-going subsidy disputes between Airbus and Boeing with Dr. Rainer Ohler, SVP Public Affairs and Communications, Airbus SAS. My research studies were highlighted by the different entrepreneurial

approach and *modus operandi* of large commercial airline business between Airbus and Boeing. I would also like to thank Mr. Francisco W. Peiro, Aeronautics and Raw Materials, DG TRADE G.2 – Industrial Sectors, European Commission in Brussels for the generosity and hospitality extended to me during my interview in his office in Brussels. He generously spent a great deal of time with me from his busy schedule discussing Airbus side of the views on NASA's critical role of subsidizing Boeing. And also my special thanks go to Mr. Nusrat Nazeer, Senior Information Officer, Information and Media Relations Division with twenty-years of experience at the WTO (World Trade Organization) in Geneva, who kindly spent time with me in his office in Geneva discussing the basic concept of 'rules-based, negotiated agreements as they relate to Airbus vs. Boeing subsidy disputes at the Disputes Settlement Mechanism of the WTO.

Following the critical comments gained from my research supervisors and reviewers, this thesis has been restructured to make it more useful and effective to those who are interested in the international political economy and international trade politics and disputes. I was very fortunate to have the opportunity of receiving the critical comments on my thesis by two PhD joint examiners, who are distinguished scholars in the business management and the politics: Steven McGuire, Professor of Business Management of Aberystwyth University and Ben Clift of the University of Warwick. I also thank the institutions and individuals who have contributed new information and assisted me to make this research possible and bring the thesis to its eventual fruition.

DECLARATION

This thesis was presented in accordance with the regulations for the degree of Doctor of Philosophy. It has not been submitted in any previous application for degree at any other academic institutions. I declare that the thesis is strictly my own work. It has been conducted all by me under Professor Grant, my research supervisor at the University of Warwick.

In revising the originally submitted study, examiner's comments were followed, research questions further explored and competing hypotheses re-examined.

ABSTRACT

The core issues of this thesis are the EU-US airplane subsidy disputes, which are market-share driven, political-economic conflicts of interest, arising from the duopoly competition between Airbus and Boeing in the fourteen-year period from 1997 to 2011. The Airbus vs. Boeing dispute case is characterized by the complexity of the dispute - the largest ever to go before the World Trade Organization (WTO) in Geneva. The thesis focuses on government subsidy disputes between two big political and economic powers – the EU and the US – through an in-depth analysis of both sides of the arguments. With duopoly in the large commercial airplane industry, new insight can be gained through better understanding of potential net welfare gain or loss from having two competitive manufacturers competing against each other in a free marketplace.

The legal issues are the core narratives of this thesis. Use of the case study enables us to better understand how these two corporate players, markets, and government policies make the difference in terms of economic outcomes. Hence, it is an effective means of addressing key problems in the real world of the large commercial airplane industry. The value added of this thesis comes from the contribution to scholarly research and practice by placing the Airbus vs. Boeing case study at the core of its political-economic debate on government subsidy issues.

Therefore, the main theoretical framework of this study is state-business relationships,¹ which explore different approaches in the EU and the US while recognizing that there are some differences between EU member states of Airbus². The study explains how the Airbus vs. Boeing case will be used, - and how it will

be located within the wider theoretical and disciplinary perspectives of state-business relationships, based on the concepts developed by Susan Strange with some reference to the 'varieties of capitalism' debate by Peter Hall and David Soskice³. The political-economic differences across the states are captured by the concepts advanced in the 'varieties of capitalism' debate, while both the state-business relationships and the 'varieties of capitalism' approach were used to understand the individual corporate variations of Airbus and Being's different business models.

This study also investigates the political-economic implications of European competition policy, and the politics associated with it. The core of the subsidy dispute is about the relationship between the state and business in the context of the world trading system. The World Trade Organization (WTO) plays a critically important role by offering a dispute settlement mechanism - specifically as to what kind, and how much, aid a state can legally give to a business enterprise.

ABBREVIATIONS

ATP	Advanced Technology Program
B&O	Washington state "Business and Occupation" tax
B&P	Bid & Proposal
BCA	Boeing Commercial Airplanes
CHRA	Corporate Headquarters Relocation Act
CEO	Chief Executive Officer
CME	Coordinated Market Economy
CPE	Comparative Political Economy
DCMA	Defense Contract Management Agency
DCAA	Defense Contract Accounting Agency
DoD	Department of Defense
DSB	Dispute Settlement Body
DSU	Disputes Settlement Understanding (Understanding on Rules and Procedures Governing the Settlement of Disputes)
DTI	Department of Trade and Industry
EADS	European Aeronautics Defense System
EC	European Communities
ECFWS	European Communities First Written Submission
"EDGE"	"Economic Development for a Growing Economy" Tax Credit Act
FCA(AB)	FCA (Appellate Body)
GATT	General Agreement on Tariffs and Trade
IAM	the International Association of Machinists

IPE	International Political Economy
IR&D	Independent Research and Development
IRBs	Industrial Revenue Bonds
ITAR	International Traffic in Arms Regulation
JADC	Japan Aircraft Development Corporation
LCA	Large Civil Aircraft
KDFA	Kansas Development Finance Authority
LME	Limited Market Economy
MDC	McDonnell Douglas Corporation
MFN	Most Favored Nation
MITI	Ministry of International Trade and Industry
NASA	National Aeronautics and Space Administration
R&D	Research and Development
R&T	Research & Technology
RDT&E	Research, Development, Testing, and Evaluation
SCM	"Subsidies and Countervailing Measures" Agreement
SPEEA	Society of Professional Engineering Employees in Aerospace
USFWS	United States First Written Submission
WTO	World Trade Organization

INTRODUCTION

In 2004, the United States (US) government filed a complaint to the WTO (World Trade Organization) on behalf of Boeing over the use of subsidies from European Union (EU) governments to Airbus, which amounted to \$205 billion over the past 35 years⁴. It was the largest case ever to go before the WTO Dispute Settlement Body (DSB) in Geneva, Switzerland.

The US alleged that Airbus's continued use of subsidies from governments in the EU violated WTO rules and distorted free competition. These EU governments, however, counterclaimed that the US government subsidized Boeing through various other means, including military sales and federal state tax breaks.

For several decades, the large commercial airplane business has played a starring role in the EU and US economies. No other companies have better epitomized that starring role than Airbus and Boeing, on both sides of the Atlantic, which has come as a result of the dynamic growth of both companies, and has been further enhanced by mergers and acquisitions since the 1990s. Thus, both the EU and US have big stakes in a political and economic relationship - a marketplace worth trillion dollars.

Since the EU became a major player in global trade, rivaling the US, Airbus has become the only rival to Boeing in the large commercial airplane marketplace. While Airbus is a consortium company financed by several European governments, including France, Germany, UK, and Spain, Boeing is a private American company publically registered and traded in the New York Stock

Exchange. At various points over the last four decades, the Airbus-Boeing competition has accumulated in several EU-US airplane subsidy disputes, each company accusing the other of unfair trade practices. Such accusations have sometimes highlighted a serious conflict of interest between the EU and the US. Moreover, the publicity surrounding the EU-US subsidy disputes has often appeared highly political, and has undermined the efforts of both governments to protect their national interests and save their local companies.

This thesis analyzes the sources of the political-economic subsidy disputes between the EU and the US governments and their airplane makers, Airbus and Boeing. It examines the means employed to prevent and settle the disputes both bilaterally through the 1992 – 2004 GATT Agreement and through the Dispute Settlement Body (DSB) of the WTO. The main theoretical framework of this thesis consists, therefore, of two theories: the theory of state – business relationships and the theory of varieties of capitalism. The theory of state – business relationships explore different approaches in the EU and the US, while recognizing that there are some differences between the EU member states of Airbus.⁵ The theory of varieties of capitalism derives from the contemporary capitalism. The theoretical applications on the empirical studies of Airbus vs. Boeing disputes elucidate how business decision makers, government policy makers, and scholars will benefit as they relate their analyses to varieties of many industrial segments that form the contemporary capitalism.

There are three main themes underlining this thesis: first, the cross-cutting theme of this thesis is the on-going disputes between Airbus and Boeing regarding the EU government subsidies to Airbus and the alleged US government subsidies to Boeing. The second theme of this study is the highly intensive nature of

the existing duopoly competition between the two distinctly different business models of Airbus vs. Boeing. With strong financial support from EU governments, Airbus has been able to maintain a competitive edge over Boeing for decades, continuously dominating a major share of the market. The third theme relates to the politics of the EU and the US governments, which continues to directly and/or indirectly effect the outcome of the Airbus vs. Boeing duopoly competition.

In recent years, the disputes have become the most prominent case at the WTO. But government subsidies have been an issue with Airbus and Boeing since the late 1970s, and since then, have turned into a series of trade disputes between the EU and the US, with both defending the national interest of their top exporters and star players, Airbus and Boeing, and locking them in one of the most politicized subsidy disputes in recent history. In 2007, the issue reached the Dispute Settlement Body (DSB) of the WTO.

The special state-business relationship that exists between Airbus and its European sponsor countries can be seen in the form of EU government loans, provided to Airbus at a below-the-market rate.⁶ Boeing, a private US enterprise like any other private US corporation, does not expect any subsidies from the US government. Indeed, the US policy toward private business enterprise is clearly evidenced by the way in which the US government distanced itself from Boeing's near bankruptcy in the late 1960s. However, it has since taken a more proactive approach to the private US industry. Boeing, being the top US exporter of large commercial airplanes and also a major US defense contractor, is a crucial contributor to the US balance of payment. Therefore, in an effort to win the EU - US subsidy litigation, Airbus and Boeing both received a great deal of attention and

support from their own governments, which represented these two airplane makers,, during the lengthy legal proceedings at the DSB of the WTO in Geneva.

The US government claimed that Airbus benefitted from EU member state and EU subsidies, enabling the company to develop a full product line of airplanes and gain more than a fifty percent of the market share of large commercial airplane sales. The US also argued that every major Airbus airplane model was subsidized, in whole or in part, by EU governments in the form of "launch aid." The US further argued that EU governments continued financing with no or low interest rates, with repayment tied to, and entirely dependent on sales of the financed aircraft. If a particular Airbus model does not sell well, Airbus does not need to repay the financing. The case in point is that the Airbus A380 triple deck "super jumbo" jet received approximately US\$3.7 billion subsidies from France, Germany, Spain and the United Kingdom.

Airbus retained its major market share with the aid of launch money from EU governments. Therefore, the US alleged that Airbus's continued use of subsidies from EU governments violates WTO rules and distorts free competition. However, the EU government counterclaimed that the US helped Boeing through various ways and means, including technology transfers from the military airplane technology to the commercial airplane technology, and federal and state tax breaks.

Since the EU became a major player in global trade, Airbus has become Boeing's only rival. Both are widely recognized as the most competitive large commercial airplane manufacturers in an on-going duopoly competition. The large commercial airplane industry operates in a fast changing political-economic environment in which the Airbus vs. Boeing duopoly is a zero-sum competition: a gain for Airbus results in a loss for Boeing. The aforementioned three themes of this

thesis were therefore developed in order to examine the political-economic implications of the on-going EU-US subsidy disputes.

The European and US governments each presented the Airbus vs. Boeing dispute case to the first meeting of the panel on the 27th of September 2007. An interim ruling on the case scheduled for October 2007 was delayed and rescheduled. In late 2009, the judicial panel of the WTO finally made a preliminary ruling in favor of Boeing. The ruling was that the EU governments' financial aid to the Airbus A380 super jumbo jet was illegal. The final ruling of the Airbus vs. Boeing case at the WTO was made in 2011. At the June 2011 DSB meeting at the WTO, it was decided that the EU and its member states would have to withdraw subsidies or remove the adverse effects within six months.

LITERATURE REVIEW

As a result of these government subsidy disputes, two studies were published on the subject of government subsidy issues, linked with the EU-US trade policy. The first, a 1990 Gellman study commissioned by the US government, examined the economics of Airbus commercial airplane programs and the potential effects of Airbus's presence on both the market for commercial airplanes and on competing US firms. The study argued that Airbus programs would not have become commercially viable, nor could they have existed, without government subsidy. The study also argued that Western Europe's share of the worldwide transport market would have been lower. The second study presented the counter-arguments of the US law firm Arnold and Porter, hired by Airbus. This 1991 Arnold and Porter study

documented the direct and indirect subsidies the US government allegedly offered to US manufacturers. The study also alleged the existence of a US government subsidy in the form of technology transfers from the military to commercial airplanes. However, the eventual demise of Douglas Aircraft, due to the lack of available capital in the US and abroad, helped reinforce US arguments regarding the absence of subsidies in the US commercial airplane industry.

The limitation of these two studies commissioned by Airbus and Boeing is that they were conducted about twenty years ago, and were commissioned by the parties specifically to suit their side of the subsidy disputes. Moreover, when they were undertaken, Boeing was an industry leader in the large commercial airplane business. Since then, Airbus has made great strides. As noted above, with the sustained use of subsidies from the EU governments, Airbus has become a market share leader.

Two empirical studies have been conducted by Baldwin and Krugman (1988) and Klepper (1994), to determine the profit-shifting and welfare effects the entry of Airbus has had on Europe, the US and the rest of the world. Both studies conclude that the Airbus entry would have been unsustainable without subsidies and that Airbus caused significant welfare losses to the US. Baldwin and Krugman (1988) followed with a Spencer type (1988) incorporate a Spencer learning curve model, while Klepper (1994) provides an important addition to the earlier works of Baldwin (1988) and Krugman (1994). Baldwin and Flam (1989) also conducted a simulation study of the commuter airplane market using the same approach as that of their past studies. Miller (1988) has taken the same study approach as Baldwin and Krugman (1988), and the Klepper study (1994) of Airbus's commercial viability, by estimating discounted cash flow results for Airbus airplanes. Miller (1998) also

uses market competition simulations on Airbus's R&D subsidy effects using Airbus A330/A340 vs. Boeing 777.

In support of Airbus, extensive research studies have been conducted by two British scholars: Lawrence (2001), Director of the Aerospace Research Centre, University of the West of England (UWE), Bristol, and Director of CERMAS ESC, Toulouse; and Professor Keith Heyward, Professor of International Relations at Staffordshire University and Head of Research, Society of British Aerospace Companies. Lawrence (2001) conducted two aerospace strategic studies: one study entitled "Strategic Issues in European Aerospace" (1999) deals with strategic issues and project case studies by British scholars, including Professor Hayward and Professor Lawrence, plus the US Professor David Thornton of Campbell University North Carolina; the other, "Aerospace Strategic Trade (2001)", elaborates on the US Department of Defense's subsidy of US large commercial airplane industry. "Aerospace Strategic Trade" (2001), Lawrence (2001) scrutinizes federal financial support for US large commercial airplanes during the years 1992-1998. Lawrence (2001) argues that his study ("Aerospace Strategic Trade" in 2001) shows how the US conducts strategic trade in aerospace via industrial policy based on R&D supports. Lawrence's two studies (2001) both suggest that the US subsidizes the large commercial aircraft industry. As such, "Aerospace Strategic Trade" forms the theoretical foundations and backbone of Airbus's accusation that subsidization of the large commercial airplane industry has been, and still is, practiced by the US.

Further to this, Steven McGuire (1997), Professor of Management at the University of Aberystwyth, has examined the EU-US commercial airplane subsidy disputes in his study on Airbus, "Airbus Industrie: Conflict and Cooperation in US-EC Trade Relations." He also wrote in "Trade Politics" (2004), a book edited by

Brian Hocking and Steven McGuire, and also “The European Union and the United States: Competition and Convergence in the Global Arena” (2008), co-authored with Michael Smith.

RESEARCH OBJECTIVES

The core aim of this research is to explore the parameters and variances of the trade politics associated with the EU-US commercial airplane subsidy disputes, with the following three research objectives:

Firstly, this research investigates why the EU and the US governments have been disputing the Boeing vs. Airbus subsidy case for so many years. This research assesses the underlying conflicts of interests, dispute prevention, and dispute settlement, in order to understand how markets and government policy impact economic results. The main focus of the research is on the government subsidies of R&D expenses, which are referred to as “launch money” or “launch aid” for development of large “new generation” commercial airplanes, and also the US government’s tax treatment of Foreign Sales Corporations (FSC).⁷ Consequently, an analysis of the large commercial airplane subsidy disputes can greatly improve our understanding of how a private American enterprise, such as Boeing, continues to be so successful in the global marketplace.

A second objective of this research is to find the *raison d’être* for the commercial airplane subsidy dispute, and why the 1992 GATT bilateral agreement had lasted rather peacefully for twelve years.

The final objective is to investigate whether the DSM at the WTO functioned effectively to achieve a dispute resolution for the EU and the US.

RESEARCH QUESTIONS

The central question in this thesis has two dimensions: what is so unique about large commercial airplane subsidy disputes and what makes the disputes so difficult to resolve? These two questions also lead to the following three research questions:

1. Why have the large commercial airplane subsidy disputes been one of the longest running political-economic issues between the EU and the US?
2. Why had the 1992 GATT agreement on this issue been kept rather peacefully for twelve years until it suddenly collapsed in 2004?
3. Has the DSM of the WTO provided a mechanism for resolving these disputes?

As previously outlined, the EU-US political disputes are the recurring trade disputes between the Europeans and Americans concerning the rivalry between Airbus and Boeing specifically concerning the EU and the US governments' subsidies to the R&D of their large commercial airplane manufacturers, Airbus and Boeing. Such subsidies are often referred to as a "launch aid", because they are used as a governmental aid for the launch of new airplane programs. Since the signing of the 1992 GATT agreement, disputes between Airbus and Boeing over airplane

subsidies seemed to have subsided, but had never been fully resolved. Boeing had been calling for a “level playing field,” which means free and fair competition without government subsidies, whereas Airbus had been counter-arguing that Boeing received subsidies through government defense contracts and tax breaks.

Nevertheless, Airbus and Boeing kept the 1992 GATT agreement for 12 years. Boeing finally filed complaints at the WTO in late 2004 and terminated the 1992 pact. Airbus immediately followed suit. As such, this study undertakes an in-depth analysis of the competition policy of the European Union and also examines the causes and determinants of the EU-US government subsidy disputes.

RESEARCH METHODOLOGY AND HYPOTHESES

Research Methodology

Qualitative methods were used to answer the research questions and hypotheses. This took form of semi-structured, in-depth face-to-face and telephone interviews with Airbus and Boeing senior management and industry officials in October 2009. Their details are as follows:

- Mr. Francisco W. Peiro, Aeronautics and Raw Materials, DG TRADE G.2 – Industrial Sectors, European Commission in Brussels on October 13, 2009.
- Mr. Nusrat Nazeer, Senior Information Officer, World Trade Organization in Geneva, Switzerland on October 15, 2009.

- Mr. Charlie Miller, Director of Boeing UK in Boeing London office on October 26, 2009.

Telephone interviews were conducted as follows:

- Mr. Ted Austell, Boeing executive at the Washington D.C. office in charge of Airbus–Boeing disputes.
- Dr. Rainer Ohler, Airbus executive in Toulouse, France, recommended “Aerospace Strategic Trade: How the U.S. Subsidized the Large Commercial Aircraft Industry,” authored by his mentor, Philip Lawrence.

The theoretical framework of this thesis is developed in Chapter 1: Theoretical Foundations. The main theory of this thesis is based on the theory of “Varieties of Capitalism,” authored by Hall and Soskice, as well as Susan Strange’s studies of multipartite relations between government and business (or states and firms). In her study, Strange (1988) defines what is *not* theory and what *is* theory.⁸

Hypotheses

The following hypotheses have been developed and will be tested in this research:

1. Without the continued ‘launch aid’ from EU governments, Airbus would not have been able to speed up the development of a full product line comparable to Boeing’s.
2. With the sustained use of subsidies from EU governments, Airbus has been able to surpass Boeing and has captured the major market share since 2003.

3. Boeing Commercial Airplanes Group receives benefits from cross-subsidization in the form of technology transfers from the US military airplane manufacturing technology.
4. Boeing was aided by two levels of subsidies: at the state government level from the state of Washington, and at the federal government level through US defense contracts.
5. Boeing terminated the 1992 GATT agreement in order to pressure Airbus to cut off, or delay, the continued 'launch aid' for a new airplane program.

STRUCTURE OF THE THESIS

By way of background, and as a means of providing a theoretical framework, the thesis starts with an account of the theoretical foundations on which the research has been developed. It proceeds as follows:

CHAPTER 1: THEORETICAL FOUNDATIONS

The chapter presents the case of Airbus-Boeing duopoly and explains the theoretical implications of the empirical case studies. Theoretical foundations are based on two theories: the state-business relationship and the theory of "Varieties of Capitalism". The chapter begins with an analytical basis for conceptualizing the EU-US subsidy disputes in the strategic duopoly competition in the commercial airplane industry.

CHAPTER 2: AIRBUS, BOEING, AND THE WTO

This chapter analyzes the features, characteristics, and the competitiveness of the two players, Airbus and Boeing, and how they operate in the duopoly competition in the world market. The chapter also examines the roles and theories of the WTO and how the dispute settlement mechanism of the WTO works in the litigation of the Airbus vs. Boeing case.

CHAPTER 3: MAKING/MARKETING LARGE COMMERCIAL AIRPLANES

The chapter examines the Airbus vs. Boeing business practice and competition that led to the subsidization by the government in the broader context of global business in which these two players manufacture, market, and sell large commercial airplanes. The chapter also examines the marketing strategies of Airbus and Boeing.

CHAPTER 4: THE TERMINATION OF THE 1992 EU-US AGREEMENT

The chapter explains the 1992 GATT agreement and investigates the termination of the 1992 EU-US bilateral pact in 2004.

CHAPTER 5: THE CASE OF THE EUROPEAN UNION AT THE WTO

The first panel hearing in the case took place on 26-27 September 2007. In the WTO case against the US, the EU made numerous allegations on various US subsidies to Boeing.

CHAPTER 6: THE CASE OF THE UNITED STATES AT THE WTO

This chapter examines the way in which the focus on the EU-US subsidy disputes was placed and how the US led the case against the EU at the WTO.

CHAPTER 1

THEORETICAL FOUNDATIONS

INTRODUCTION

This chapter sets the stage for the Airbus vs. Boeing case study in the EU-US transatlantic airplane subsidy disputes by presenting the theoretical foundations that potentially enhance the understanding of state-business relationships. The theoretical contribution that this thesis makes is to improve our understanding of state-business or government-business relationships through the empirical research of Airbus vs. Boeing. The on-going EU-US subsidy disputes are directly related to state-business relationships in the context of the global trading system, the thematic link of which is illustrated in the following schematic:

State - Business Relationships => Global Trading System => EU - US Subsidy Disputes => Airbus vs. Boeing => World Trade Organization

No in-depth academic research has been undertaken on the subject of on-going Airbus vs. Boeing government subsidy disputes. The originality of this Airbus vs. Boeing subsidy dispute case study hopefully makes distinctive, value-added contributions to the understandings of the EU-US government subsidy disputes in question, the subsidy disputes more generally, the contentious nature of the global trading system and how the disputes are to/or not be resolved within it, as

well as more broadly the changing nature of the relationship between the state and business in a changing global/domestic context.

This study explains how the Airbus vs. Boeing case will be used and how it will be located within wider theoretical and disciplinary perspectives of state-business relationships with reference to the Varieties of Capitalism debate. The core of the subsidy disputes is about the relationships between state and business (governments and firms) in the context of the global trading system. The WTO plays an important role in the world trading system – specifically as to what kind of help and how much a state can legally give its private business.

Therefore, the main theoretical frame of this study is state-business (governments-firms) relationships which explore different approaches in the EU and the US while recognizing that there are some differences between the involved EU member states in relation to Airbus.⁹ These political-economic differences across the states are captured by the second theory, the “Varieties of Capitalism” debate. These two theories, the theory of state-business relationships and the theory of “Varieties of Capitalism,” were used to understand the individual corporate variation between the different business models of Airbus and Boeing. With duopoly in the commercial airplane industry, there is, potentially, a net welfare gain from having two competitive manufacturers cut free of subsidies.

THE THEORY ONE: STATE-BUSINESS RELATIONSHIPS

This chapter seeks to review a useful theoretical framework in the theory of state-business (governments and firms) relationships. There are three main players to be

considered in state-business relationships: the state (or government), business (or firms), and the trade associations that serve as intermediaries between the state and business (Coen and Grant, 2006, p13).

However, in the UK and the US, governments and big businesses have been dealing directly with very large firms bypassing trade associations.¹⁰ In these countries, trade associations never exerted much discipline over individual firms (Coen and Grant, 2006, p56). The relationships between European firms in the aerospace industry and their respective states have both some common traits and other characteristics that remain specific to each country (Hayward, 1995, p195). The EU in this study encompasses three major European states representing the major shareholders of Airbus: France, Germany, and the UK. The EU-US airplane subsidy disputes reflect a fundamental divide and political-economic differences between the EU member states of Airbus on one side and the US on the other.

There are some differences across these three major EU member states.¹¹ The 'Comparative Capitalism' and the 'Varieties of Capitalism' approach will provide insight into key features of contemporary capitalism by explaining the similarities and differences of the most developed economies of the EU and the US, as well as the differences across EU states. A 'Varieties of Capitalism' approach can provide the basis of a productive interchange among scholars researching many issues in economics, industrial relations, social policy-making, political science, business, and the law (Hall and Soskice, 2001, p68).

In her work on state-firm relationships, Strange (1992, p6) argues that governments must face up to structural changes in world politics, particularly regarding the structure of production in the world economy, and must pay proper attention to the increasing importance of firms. Many political-economic changes

have taken place in recent decades: the liberation of the former communist bloc followed by the collapse of the former Soviet Union, the rapid rise of the East Asian countries, China's surpluses, the US chronic deficits, etc.

Strange (1992) claims that 'these common driving forces of change are the accelerating rate and cost of technological change', and have facilitated the globalization of production as well as increased capital mobility. She also argues that these structural changes have permeated beyond finance and production to deeply effect global politics.

Strange further suggests that because of these structural changes, governments must now bargain not only with other governments (government-government relation), but also with firms or enterprise (government-firm relation), while firms bargain with governments (firm-government relation) and with one another (firm-firm relation). She also supports the view that the intensification of competition among states for world market shares has forced states to bargain with foreign firms to insure that they locate their operations within the territory of the state, urging national firms not to leave home.

How will the case study be used and explained by the state-business relations model? The Airbus-Boeing case study will be used within the wider theoretical perspectives of state-business relationships, which will provide a theoretical base for explaining the EU-US airplane subsidy disputes. Such a theoretical base reveals the roles of Airbus and Boeing in a competitive context: the EU and the US government-business relationship and, EU and US government policies. However, there are some substantial political-economic differences between European capitalism and American capitalism as well as within individual European states.

The study will address the competitive issues of Airbus vs. Boeing and the challenges of global competition within the theoretical framework of state-business relationships. The nation, its government, and business (or firms) all have a role in this framework. Airbus' source of competitiveness and sustained use of 'launch aid' from EU governments will be critically assessed and explained by a theoretical framework that the state-business relation theory can provide.

In the state-business relationships in Europe, there was 'a growing tendency of using large national enterprises in an effort to solve specific problems, as if they were agencies of the state' (Vernon, 1974)¹². The European idea behind it was to develop a national champion as a public policy – “an enterprise responsive to its national government's needs and entitled to its national government's support” (Hayward, 1995). “Providing capital on favored terms was one typical device; discriminating in government procurement policies was a second; subsidizing research programs a third” (Vernon, 1974, p12). “Whatever the method, it implicitly or explicitly embodied one important factor: the exercise of public power to discriminate in favor of chosen national champions” (Vernon, 1974, p12).

What roles do national governments play when European firms face competition from American firms, or American firms face competition from European firms? Specifically, what strategic roles do EU states play for Airbus, which is regarded as having a strategic and critical place in the EU economy? What are the major differences in state-business relations between the EU and the US? Those are some of the many questions that can be explained within a conceptual context of state-business relationships.

PROBLEM OF COMPARATIVE CAPITALISM APPROACH TO STATE-

BUSINESS RELATIONSHIPS

The difference between state-business relationships in the EU and the US can be explained by a Comparative Capitalism approach, which may be used to compare many kinds of economies, and to consider how firms coordinate their endeavors. Comparative Capitalism is based on the perspectives of institutional variations. The following three perspectives have been in the mainstream of Comparative Capitalism over the last thirty years: a 'modernization approach'; 'neo-corporatism'; a 'social systems of production' approach (Hall and Soskice, p2).

The 'modernization approach' to Comparative Capitalism regarded the principal challenge facing developed economies as the modernization of industries that still operated according to pre-war practices, promoting high rates of national growth. Those taking this approach focused on institutional structures. Thus, states were given more leverage over the private sector, such as planning systems and public influence in the financial system (Cohen 1977; Estrin and Holmes 1983; Zysman 1983; Cox 1986)¹³. Countries were often categorized as 'strong' and 'weak' states (Katzenstein 1978b; Sacks 1980; Nodlinger 1981; Stocpol and Amenta 1985)¹⁴. Based on this perspective, for example, France was regarded as a model of success, while the UK was seen as a "laggard" (Shonfield 1965; Johnson 1982)¹⁵.

The concept of 'neo-corporatism' was developed as a second approach to Comparative Capitalism during the 1970s, when inflation became a key problem facing developed economies (Schmitter and Lehmbruch 1979; Berger 1981; Goldthorpe 1984; Alvarez et al. 1991)¹⁶. Neo-corporatism was associated with the capacity of a state to negotiate collective bargaining with employers and trade

unions on wages, working conditions and social or economic policy¹⁷. Therefore, a state's capacity for neo-corporatism was generally dependent upon the centralization of the trade union movement.

The "social systems of production" approach was a new approach to Comparative Capitalism during the 1980s and 1990s¹⁸. It included analyses of sectoral governance, national innovation systems, and flexible production regimes¹⁹. These studies pay more attention to the behavior of firms in response to the reorganization of production necessitated by technological change²⁰. They put an emphasis on the movement of firms "away from mass production toward new production regimes that depend on collective institutions at the regional, sectoral, or national level"²¹.

The neo-institutionalist approach to Comparative Capitalism has been critiqued by Colin Crouch (2005). He takes a close look at Comparative Capitalism literature and the way in which neo-institutionalist approaches to the "diversity of capitalism are falling into the trap of oversimplification and determinism" (Crouch, 2005, p22-23). He argues that over-simplification often results in confusion between ideal types and cases, and suggests ways in which institutional entrepreneurs can achieve change. By his definition, institutional entrepreneurs approach institutions in the same way that economic entrepreneurs approach business opportunities. Crouch (2005) develops a theory of governance mode by recombining the governance mechanism that the institutional entrepreneurs use to make changes and achieve their goals. He presents some examples of compound and recombinant governance in action through an account of the institutions that govern the high-tech sectors of Southern California and recombinant governance in the neo-liberal turn in the UK at the end of the 1970s.

THE THEORY TWO: “VARIETIES OF CAPITALISM” APPROACH TO THE THEORY OF STATE-BUSINESS RELATIONSHIPS

The theory of “Variety of Capitalism” (Hall and Soskice, 2001) goes beyond these three preceding perspectives of institutional variations that have dominated the study of Comparative Capitalism. The “Varieties of Capitalism” approach is an actor-centered concept in a firm-centered economy where strategic interactions of firms are crucial to the behavior of economic actors, while Comparative Capitalism is based on the perspectives of institutional variations.

The major emphasis of Hall and Soskice was that there was no single form of capitalism (Crouch, 2005). Indeed, there are some political-economic differences between Europe and the US and within the individual European states. What explains these individual political-economic differences across the states? Some see these differences as deviations from “best practice” that dissipate as states catch up to a leader,²² while others regard them as the “distillation of more durable historical choices for a specific kind of society”²³. This is because economic institutions limit the level of social protection, income distribution, and collective goods at one's disposal - features of the social solidarity of a nation (Hall and Soskice, 2001). Hall and Soskice argue that, in each case, the comparative political economy revolves within a theoretical framework, which is used to explain institutional variation across states.

Hall and Soskice (2001) support the view that features of states once regarded as attributes of strength actually impede the implementation of many

economic policies. Instead, they look for a basis for comparison more firmly established in the organization of the private sector.²⁴ Firms need to be brought back into the core of the analysis of Comparative Capitalism by highlighting the role that business, and its associated relationships with firms play in the political economy.²⁵ Hall and Soskice (2001) depart from the Comparative Capitalism approaches with their conception of how behavior is affected by the institutions of political economy. For an analysis of Comparative Capitalism, there are three frameworks that explain how institutions of political economy affect the behavior of economic actors.²⁶ First, institutions are seen as socializing agencies that set norms or attitudes. Second, the effects of an institution follow from the power²⁷ (e.g. power of policy-makers or trade union leaders) it provides to particular actors. A third framework sees institutions as a matrix of sanctions and incentives (e.g. the willingness of trade unions to moderate wages to lower inflation).

The core argument of Hall and Soskice (2001) is that Comparative Capitalism is short of strategic interactions and that these approaches tend to miss strategic interactions, which are central to the behavior of economic actors. So the most important institutions distinguishing one political economy from another will be those conditioning such interaction, and it is these that need to be captured in this analysis. By locating the firm at the centre of the analysis, Hall and Soskice attempt to connect business studies with comparative political economy, the two disciplines that are all too often neglected and disconnected.

The "Varieties of Capitalism" approach to the political economy is actor-centered, where each of a number of multiple actors seeks to advance their interests rationally in strategic interactions with others (Scharpf, 1997a). In the framework of actor-centered institutionalism, Scharpf (1997a, p36) combines actor-

centered and institution-centered approaches in an integrated framework. However, the major difficulty with the actor-centered approach is that they must, at bottom, rely on intentional explanations that are inevitably based on subjectivities (Dennett 1981; Rosenberg 1988).²⁸ In the actor-centered concept, 'actors are characterized by their orientations such as perceptions and preferences and by their capabilities' (Scharpf, 1997a, p51). The actors include individuals, firms, producer groups, and governments in a firm-centered economy where the firms are regarded as crucial actors in a capitalist economy.²⁹ Firms are the core agents of adjustment facing technological change and global competition,³⁰ and the firms' activities are translated into overall levels of economic outcomes.³¹

CORE COMPETENCIES

Hall and Soskice look at a conception of the firm being relational. Firms are seen as actors seeking to develop and exploit core competencies³² or dynamic capabilities as capacities for developing, producing, and distributing goods and services profitably (Teece and Pisano, 1998).³³ In order to resolve coordination problems central to their core competencies, Hall and Soskice (2001) argue that firms develop relationships in five spheres: industrial relations, vocational training and education, corporate governance, inter-firm relations, and their own employees (Hall and Soskice, 2001, p6-7). For example, Boeing's 'market shaping' strategy includes development of core competencies as well as detailed customer knowledge specifications in order to develop these capabilities needed now and the future.

LIBERAL MARKET ECONOMIES (LME) AND COORDINATED MARKET ECONOMIES (CME)

This analysis seeks to provide a conceptual approach that can be used to compare different kinds of political economies in the EU states and the US where Airbus and Boeing coordinate their endeavors. These EU states and the US can both be classified as either Liberal Market Economies (LME) or Coordinated Market Economies (CME) that constitute two ends of a political-economic spectrum encompassing a whole array of many states. The US and Britain are primarily Liberal Market Economies (LME). Germany represents a Coordinated Market Economy (CME).

In France, the old French model has disappeared and a new model has emerged exemplifying the dynamics underlying the adjustment of the French economy. The implication for the French political economy is the increasing importance of the market and the simultaneous reduction of the state's role in the French political economy. Hall and Soskice make a core distinction between liberal market economies and coordinated market economies (2001, p8). In general, liberal market economies differ from coordinated market economies to the extent that firms rely on market mechanisms to coordinate their endeavors, as compared to forms of strategic interaction supported by non-market institutions (Hall and Soskice, 2001, p33).

In liberal market economies, firms coordinate their activities through hierarchies and competitive market arrangements. Williamson (1985) describes these forms of coordination from the perspective of transaction cost economics: "Transaction cost economics characterizes human nature as we know it by

reference to bounded rationality and opportunism” (Williamson, 1985, pp44-48). He argues that there are three levels of rationality: the strong form is “maximizing”, the semi-strong form is “bounded rationality”, and the weak form is “organic rationality.” “Bounded rationality” is the cognitive assumption that transaction cost economics relies on, while “opportunism” refers to the incomplete or distorted disclosure of information.

Market relationships are characterized by the exchange of goods and services through competition and formal contracting. Market institutions provide a means for coordinating with the economic actors (Hall and Soskice, 2001, p8). According to Hall and Soskice (2001, *ibid.*), in coordinated market economies, firms are heavily oriented towards non-market relationships that coordinate with other actors and construct their core competencies. In coordinated market economies, the financial system (or market for corporate governance) provides firms with access to finance that is not entirely dependent on publicly available financial data.

Differences between liberal and coordinated market economies are reinforced by institutional complementarities (Hall and Soskice, 2001, p17). The point about institutional complementarities is relevant to the study of Comparative Capitalism. Hall and Soskice (2001, p17) support the view that complementarities also exist in the operations of a firm. They also suggest that “two institutions can be complementary if the presence (or efficiency) of the one increases the returns from (or efficiency) of the other”.³⁴ Efficiency in these firms could be further increased if two firms operated under no subsidy conditions in airplane manufacturing, according to the WTO rules, because they will strive for the most efficient and the most innovative way to manufacture airplanes in order to survive free competition in the level playing field.

AMERICAN STATE-BUSINESS RELATIONSHIP

American 'Managerial Capitalism' inspired the largest and fastest-growing market in the world when the nation completed its communication and transportation network and perfected its operating methods in the 1870s and 1880s (Chandler, 1984, p492). American entrepreneurs recruited management teams in production to capture the potential of scale economies and invest in distribution to market the mass-produced goods at home and abroad, as did all the industries "in which large industrial firms would cluster for the following century" (Chandler, 1984 pp492-493). In large, complex business organizations in the US, full-time salaried managers came to make decisions as to both current and future production and distribution and the allocation of resources (Chandler, 1984 p494). By then, owners rarely made managerial decisions because of the greatly increased size and complexity of the enterprise. Thus, Managerial Capitalism was firmly established as a major segment of the American business enterprise which was characterized by separation of ownership from management.

The American liberal tradition was permeated by anti-state norms, the state (or government) being viewed as 'a permanent threat to the individual's liberty to speak, worship, produce or dispose of property free from censorship, regulation, legislation and taxation' (Hayward, 1986, xii).

In liberal market economies, firms rely more heavily on market relations to resolve coordination problems, while in coordinated market economies, firms address the market relations and coordination problems through non-market coordination, which entails collaboration and strategic interaction (Hall and Soskice,

2001, p27). In the major spheres of firms' endeavors, competitive markets are more robust with less institutional support for non-market forms of coordination.

As such, while in coordinated market economies, corporate networks provide investors with inside information through corporate networks, firms in liberal market economies focus on quarterly balance sheets, current profitability, and current share values, in order to ensure access to finance or deter hostile takeovers (Hall and Soskice, 2001, p27).³⁵ Secondly, in the industrial relations arena, firms in liberal market economies generally rely heavily on the market relationship between individual workers and employers to organize relations with their labor force. Management normally has unilateral control over the firm, including freedom to hire and fire (Hall and Soskice, p29). Thirdly, the education and training systems are generally complementary to these highly fluid labor markets (Hall and Soskice, p30). Finally, inter-company relations in liberal market economies are based on standard market relationships and enforceable formal contracts. In the US, these relations are also mediated by rigorous antitrust regulations designed to prevent companies from colluding to control prices or markets and doctrines of contract laws (Hall and Soskice, p30).

How does technology transfer take place in liberal market economies? Generally, technology transfer is secured through the movement of scientific personnel from one company to another that fluid labor markets facilitate (Hall and Soskice, 2001, p31). These scientific personnel bring their technical knowledge with them. Liberal market economies also rely heavily on the licensing or sale of innovations to achieve technology transfer. How does technology transfer apply to commercial airplane manufacturing? Airbus argues that Boeing acquires technical knowledge from US defense contracts, and transfers the acquired technology to

commercial airplanes. Airbus contends that such technology transfers constitute forms of governmental subsidy.

FRENCH STATE-BUSINESS RELATIONSHIP

By contrast to the American liberal tradition of anti-state norms, the French tradition is in favor of state forces rather than market forces. France, having long lived within the Roman Law tradition, kept a normative and actual state dominance with authority mechanisms left largely intact (Hayward, 1986). It was taken for granted in France that “governments could decide what they wanted to happen and were able to make it happen” (Hayward, 1986). The French market-relationship is a “centralized, unitary political structure, super-ordinate to a society in general and market forces in particular” in contrast to the American’s “fragmented, federal political structure operating in a market-dominated, pluralistic political and economic system” (Hayward, 1986, pp16-20). Even if France later edged in a more liberal direction in response to international forces, the dirigiste (French state centered policy) tradition remained strong, as reflected in the resonance of a nation of “economic patriotism”, advanced in the first decade of the 21st century.

Hall and Soskice (2001, p35) argue that each economy (either liberal or coordinated market economy) shows specific capacities for coordination that conditions what its firms and government do. The top managers of many French firms have close ties to the state but weak ties to other firms (Hall and Soskice, 2001, p35). As a result, they are less likely to pursue the corporate strategies found in Britain or Germany (Hall and Soskice, 2001, *ibid*).

Hayward (1986, p203) argues that the French government has been “most interventionist” compared to German and British governments. For example, it has not only provided Air France with financial support (two cash injections) but has also played a major role in Air France's takeover of UTA and Air Inter. In an attempt to rectify delays and cost overruns in the Airbus A380, former French Prime Minister Dominique de Villepin asked his Finance Minister to prepare management changes at Airbus and EADS, in close cooperation with European partners.³⁶ While the US government has nothing to do with Boeing's corporate affairs, management shuffles at Airbus were greatly influenced by French and German governments. For instance, the board of EADS decided to keep a dual management structure (French and German co-CEOs at the top), which is an ineffective and dysfunctional reporting system. In fact, EADS ended up hiring McKinsey to get an advice on whether to issue a profit warning. Thus, EADS kept the balance of French and German political interests instead of implementing a sound management structure with one CEO and one Chairman. The recent EADS management reshuffles were a “classical European political-industrial complex stitch up”. In essence, nothing has changed in terms of management restructuring except the replacement of French and German co-CEOs at the top.

Given the fact that Airbus is embedded with the French government which owns a 15 percent interest in EADS with the German government, it is not surprising that the French government intervened in the industrial restructuring of EADS. The state became involved in industrial restructuring and its micro-industrial approach was increasingly focused on direct dealings with a select few national champion firms (Hayward, 1986, p34). Hayward argues that in the French traditional system, the state's role was to reduce social conflict and maintain the status quo

through the use of regulations that restricted both foreign and domestic competition, slowing down the pace of change. He suggests that this helped to preserve social harmony while allowing French capacity to go its own way within the world economy; thus, business performance was only a secondary matter. Hayward possibly overstates this view, given that in practice, many French firms are competitive at an international level and increasingly engage in FDI (for example, EDF).

GERMAN STATE-BUSINESS RELATIONSHIP

In coordinated market economies, firms resolved many of these problems through strategic interaction. How can non-market coordination be achieved in the principal spheres of firms' endeavors in Germany? The following five principal spheres need to be looked at:³⁷

The financial system or market for corporate governance provides firms with access to finance that is not always based on publicly available financial data. This makes it possible for firms to make investments only in the long term. However, since finance is not dependent on the balance sheet, the core problem of CMEs (Coordinated Market Economies) is that investors must have other ways of monitoring a company performance in order to ensure the value of their investments (Hall and Soskice, 2001, p22-23). That means they must have access to 'inside' information about the company,³⁸ which is illegal in the US. In Germany, information about a company is available to investors by (a) the close relationships that have been cultivated; (b) the knowledge secured from extensive networks of cross-shareholding; (c) joint membership in active industry associations that gather

information about companies (Hall and Soskice, 2001, p23). Firms operating in “dense business networks” and potential funders can gain a great deal of inside information about the track record and projects of a firm from these business networks (Hall and Soskice, 2001, *ibid.*). Hostile mergers and acquisitions were very rare until recently. Firms need to focus on profitability and shareholder value if there is any prospect of a hostile takeover by others.

The internal structure of a firm reinforces these systems of network monitoring in many coordinated market economies. Compared to liberal market economies in the US and the UK, senior managers in Germany rarely take a unilateral action. They need to have secured agreement for major decisions from supervisory boards that include employee representatives, major shareholders, and from other managers. This German consensus decision-making encourages information-sharing, the “development of reputations”, for reliable information and network monitoring (Hall and Soskice, 2001, p24). In coordinated market economies, managerial incentives reinforce business networks. Therefore, German firms place long-term employment contracts in relation to a manager's ability to secure consensus for his projects. This leads managers to focus on maintaining their own reputation. However, long-term labor employment contracts limit the mobility of scientific or engineering personnel across firms to effect technology transfer as seen in liberal market economies. Instead, in Germany, such diffusion of technology across the economy is promoted by a number of institutions and business associations.

While American firms focus on profitability and use stock-options in managerial compensation, the incentives for German managers are in line with those of German firms (Hall and Soskice, 2001, *ibid.*). Many firms, including German

firms in coordinated market economies, use production strategies that provide highly skilled workers with substantial autonomy to encourage them to share the information they acquire. Such strategies generate continuous improvements in production lines and production processes (Hall and Soskice, 2001, *ibid*). German firms' coordinated market economies make use of labor with high industry-specific or firm specific skills (Hall and Soskice, 2001, p25), and use education and training systems that enable workers to develop such skills³⁹. Germany relies on industry-wide employer associations and trade unions to supervise a publicly subsidized training system.

AMERICAN LIBERAL MARKET ECONOMY (LME) vs. GERMAN COORDINATED MARKET ECONOMY (CME)

Capitalist economies are regarded as systems where companies and individuals invest, and not only in machines and materials technologies (Hall and Soskice, p22). How do CMEs differ from LMEs? There are some differences: German CMEs are used to illustrate how non-market coordination is achieved, although German CMEs may differ to some extent from other CMEs. In American LMEs, firms rely more heavily on market relations to resolve coordination problems, whereas firms in the German CMEs address forms of non-market coordination that entail collaboration and strategic interaction (Hall and Soskice, 2001, p27). In terms of the American case, competitive markets are more robust in each of the major spheres in which firms compete and there is less institutional support for non-market forms of coordination. In the German case of CMEs, the financial system typically provides companies with access to finance that is not entirely dependent on publicly available financial data (Hall and Soskice, p22). Information about a company is

available to investors by virtue of the close relationships that companies cultivate with suppliers and clients, through the knowledge from extensive networks, and by joint membership in industry associations (Hall and Soskice, 2001, p23).

BRITISH STATE-BUSINESS RELATIONSHIP⁴⁰

While organized capitalism such as that found in France and Germany has experienced a long period of very slow growth and high unemployment, the UK has pulled away from both Germany and France in terms of per capita income (Coen and Grant, 2006, p43)⁴¹. When the British Labour Party took control of government in 1997, Great Britain became one of Europe's stronger economies (Lehne, 2006 p38). Where Labour had traditionally favored state ownership of industry and government intervention in the economy, it now applauded private enterprise and privatization (Lehne, 2006, p183).

Britain's liberal market economy is characterized by low levels of business coordination, state intervention, and deregulated markets, which serve as the primary coordinating mechanism for economic activity (Hall and Soskice, 2001). Is Britain interventionist or market oriented? Hart argues that the British state has been alternately interventionist and market-oriented with respect to domestic business (Barfield and Schambra, 1986, p157). As a result, firms are often unable to resolve collective action problems and are rarely in a position to jointly provide basic supply-side goods that sustain vocational training, R&D, and long-term finance (Hall and Soskice, 2001, *ibid*). British manufacturers have mainly emphasized short-term profits in a financial system that encourages rapid turnover and an industrial relations system that promotes employers to adopt cost-cutting

practices (Rubery 1994 as cited in Hall and Soskice, 2001). Deregulation throughout the British economy also allows and sometimes forces firms in the UK to cut their operating costs (Hall and Soskice, 2001, p220).

However, the initial problem with most British business firms was the lack of a separate ownership and management. In most British firms, separation of ownership from management did not take place until after World War II. Because the UK's domestic market was smaller and was growing less rapidly than the American market, British entrepreneurs had less of an incentive than Americans to fully exploit the potential of scale economies. British industrialists generally considered their firms as "family estates to be nurtured and passed down to their heirs rather than mere money-making machines" (Chandler, 1984, p497), as they were in the US. As such, family ownership remained important, with most UK firms controlled by board members and senior management (Lehne, 2006, p74).

Growth by diversification into new product lines greatly increased the size and complexity of the business enterprise. However, British entrepreneurs preferred to manage their own businesses instead of turning their operating control over to non-family, salaried professional managers, in the way that typical American corporations did. Thompson (1989, p75) argued that, this problem had to be combated with "some drastic change in the form of management education", but a long-term projects". Indeed, the transformation from family management to professional managers came slowly. Why was this the case? The answer seems complex but Chandler (1984, p497) suggests that it lies in Britain's industrial geography and history, its educational system, a lack of anti-trust legislation like the enforcement of the Sherman Antitrust Law in the US, and a continuing commitment

to personal family management. Nevertheless, because it was the first industrial nation, Great Britain became the world's first consumer nation.

Grant (1995, p77) argues that "British government's role in relation to industry has often been that of a 'spectator' or 'auxiliary' state, exposing British firms to greater international competition and encouraging them to develop an international orientation." He also argues that Britain is the country "in which the transition from the old conception of a 'national champion' to that of the international firm has gone furthest".⁴² This partly reflects the British government's passive involvement with national champions, which has brought nothing but new political problems instead of opening up economic opportunities.⁴³ National champions were acquired because their collapse would be economically and politically too costly (e.g. British Leyland), or they were developed to create a British presence in technologically significant sectors, but eventually failed.⁴⁴ The British industrial policy is largely reactive,⁴⁵ and led to an emphasis on privatization and deregulation⁴⁶, encouraging management autonomy, efficiency, and flexibility. However, lack of confidence in domestic solutions has also led to the continued promotion of British investment policies which seek to encourage the entry of Japanese firms to compensate for inadequacies in British management.⁴⁷

In examining the relationship between major actors in Britain, Grant points out the tenuous nature of the connections between them. He argues that the inadequacies of British business associations and the relative weakness of the Department of Trade and Industry (DTI) indicate a weak relationship between government and industrial firms, characterized by misunderstandings (Grant, 1995, p80).

According to Grant, the 'national champion' seems like a dinosaur from another age (Grant, 1995, p77) and its policies a throwback to Fordist industrial structures of highly centralized, large-scale mass production. They have, however, given away to more decentralized, globally dispersed, flexible forms of lean production in the past several decades (Grant, 1995, Crane et al, 1997). Such flexible forms of accumulation "raise yet newer possibilities for how states relate to the world economy and production" (Crane et al, 1997, p17). Grant supports the view that one of the fundamental problems with the 'national champion' was that it created "an imbalance of information and expertise between government and the firms with national champion status",⁴⁸ allowing firms to take advantage of the imbalance of knowledge by demanding unjustifiable levels of assistance from the government, which has no way of checking the rationale and justification.⁴⁹

Grant (1995, p79) further argues that our theoretical understanding of the firm as an actor is underdeveloped, and that the task of integrating various insights from other relevant disciplines into a political economy of the firm has scarcely begun⁵⁰. Grant (1995, *ibid*) characterizes large British firms as: generally internationally oriented; well disposed to the process of European integration; acquisition oriented; and politically sophisticated and advanced, reflecting high-quality government relations and their experience of a "company state". However, Britain is moving in the direction of a "regulatory state" where the government's role is to "provide consumer champions to check the otherwise unfettered operations of firms oriented towards an international market" (Hayward, 1995, p81).

Competition policy in Great Britain has not been a government priority, although it emerged in the post-World War II period (Lehne, 2006, p251). The anti-trust law is strictly enforced in the US, although the 'US government's law suit

against Microsoft did not succeed. Under British law, there is no presumption against monopolies or mergers with policy seeking to regulate only those monopolies that harm the public interest (Lehne, 2006, *ibid*). Whereas British competition policies are somewhat closer to the US antitrust law, German and EU policies are more like a statist tradition. Unlike the strict US law against monopoly, the British process for enforcing monopoly and merger policies is administrative and rather lenient.

CONCLUSION

This chapter provided a theoretical foundation that will help enhance our understanding of the empirical case study of Airbus vs. Boeing subsidy disputes. The main theoretical foundations of this study are based on two theories: the theory of “state – business relationships” and the concept advanced in the “Varieties of Capitalism”. These two theories were used to understand individual corporate variation of Airbus and Boeing.

This Airbus – Boeing case study was developed within wider theoretical perspectives of the state – business relationships which provides a theoretical base for explaining the EU-US subsidy disputes. Such a theoretical base reveals the roles of Airbus and Boeing in a competitive duopoly context: the EU and US government policies. However, there are some substantial political-economic differences between European capitalism and American capitalism and within the individual European capitalism. Therefore, this thesis addresses the competitive

issues of Airbus vs. Boeing and their global competition within the theoretical framework of state-business relationships and varieties of capitalism.

The theory of state – business relationship will provide us with a better insight into the relationship between the EU governments and Airbus as well as the American relationship between the US government and Boeing. The state – business relationship theory also encompasses the state to state relationship between the EU governments and US government as well as the rivalry business relationship between Airbus and Boeing. Strange (1992) has a great foresight into the free trade and free competition that eventually led to the intensive competition between Airbus and Boeing for the world market share.

The WTO plays a critical role when ruling the critical issues and complaints about how much help a state can legally give its private enterprise, while the DSM (Dispute Settlement Mechanism) at the WTO enforces these procedures and rules. The chapter elucidated the variation of the two different corporate models, Airbus and Boeing, through the concepts advanced in the “Varieties of Capitalism” and the state-business relationship. These two theoretical concepts provide the better understanding of the government subsidy disputes between Airbus and Boeing. The subsidy disputes eventually led to the litigation in 2004 when the US filed legal complaints at the WTO and took seven years before the case finally reached the verdict at the WTO court in June 2011. However, it should be noted that the legal disputes between Boeing and Airbus were not completely ended at the WTO in June 2011. The legal ramification of the June 2011 verdict is ensued by Airbus like any other legal disputes. The legal disputes continued on at the WTO for a while as Airbus has a right to appeal until Airbus exhausts all the possible legal avenues to their satisfaction.

The next chapter will elucidate the three main actors as they directly relate to the duopoly competition: the duopolists, Airbus and Boeing represented by the EU governments and the US governments on their behalf at the WTO, which acts as an arbitrator authorized to judge the legal disputes between the EU and US governments' legal representatives.

CHAPTER 2

AIRBUS, BOEING, AND THE WTO

INTRODUCTION

The EU and the US are dominant actors on the world stage and their relationship is critically important in all aspects of global politics and the global economy.⁵¹ This chapter starts with an analysis of this relationship exploring how it has developed and impacted the main political arena. McGuire and Smith (2008) argue that the EU and the US are bound together, but in a form of “competitive convergence”, the influence of which can be seen and felt around the world.

As “two weighty actors” on the world stage, they are joined by the economic power of Japan and are now being challenged from the rising political and economic powers of Brazil, Russia, India, and China.⁵² Many of these political-economic changes are the driving forces behind the world’s political landscape and have facilitated globalization and increased capital mobility. As Susan Strange (1992) suggests, “the common driving forces of change are the accelerating rate and cost of technological change, and have increased the globalization of production as well as capital mobility and global communications.”⁵³ Alongside the EU and US and Japan, China has joined the global arena as a major player, making the China-US relationship more important than ever before. These four players continue to be the major players and are highly engaged in each other’s political-economic processes.

While the on-going EU-US airplane subsidy disputes continue, the relationship between the EU and the US remains important in all facets of the global political-economy. McGuire and Smith (2008) argue that the EU and the US are bound together in a form of “competitive convergence”, that they are well integrated in economic terms and this will continue to be a source of competition and convergence in a changing world order. Therefore, the EU-US relations can make a difference in world trade development, monetary relations, technological innovations, development and management of free enterprises through free competition policies.⁵⁴

STATE-BUSINESS RELATIONSHIPS IN EUROPEAN AEROSPACE INDUSTRY

In Europe, the military was an important facet of the aerospace industry.⁵⁵ The military interest precipitated state-business relationships in the airplane industry, including all phases of manufacturing and every aspect of aerospace technology.⁵⁶ European airplane industries are commonly assumed to be armaments-based industries, largely based in the hands of their respective governments.⁵⁷

In reference to the state-business relationship, Hayward (1995) highlights the dependence of the British airplane industry on the state.⁵⁸ In France, the army is the origin of the airplane industry because the military basically dictates the technical choices and also prevents any possibility of a monopoly. This model of the state-business relationship intensified with nationalization in 1938 and also in the post-war period. Hayward (1995, p160) argues that programs for commercial airplane manufacturing maintained the capacity for research groups and the means

of industrial production during peace-time. He contends that this situation justified the strategic character of the commercial airplane industry in France, Germany and the UK. The European aerospace manufacturing business has, however, fundamentally transformed over the past two decades (Hayward, 1995, p158). The operating environment of the European aerospace industry has been modified by a series of external changes, including the rise of Airbus, the “explosion” of the civilian market, the end of the cold war and the emergence of new political-economic and industrial strategies (Hayward, 1995, *ibid*). Hayward (1995, pp158-159) argues that such external changes in the operating environment were a genuine revolution in the very idea of “nationalized industries”, and had effect on three different levels:

Firstly, these firms became autonomous from governmental bodies and the public policies of the aerospace sector. Governments and firms – in different ways in each country – were shifted around and the firm itself became the principal actor in the new system. It replaced the old system in which a firm’s action was integrated within an overall state-determined strategy. Muller claims that “each national public policy has given itself the sole objective of contributing to growth in its company’s market share”.⁵⁹ Airbus did exactly that and finally caught up with Boeing by achieving market share parity in 2003, and has retained a market share leadership position ever since. Secondly, a multiplication of alliance strategies has been developed between European firms resulting in a “complex web of co-operative and competitive relationships”⁶⁰. Thirdly, some surprising convergence took place between the policies implemented in this sector, emerging in the profile of a European model of national enterprise – within which the public or private status no longer has much importance.

THREE STATE- BUSINESS RELATIONSHIP MODELS⁶¹

All three countries, Great Britain, France and Germany, have encouraged a public industrial development champion in the aeronautical industry. According to Hayward (1995), these three countries represent three different state-business relationship models.

The British airplane industry was very powerful at the end of the World War II and was ahead of the American airplane industry in certain fields, such as jet propulsion. In order to keep this technological edge, those who favored public intervention organized themselves against the British Treasury, which was rather skeptical about allocation of public funds to the airplane industry. Clearly, state aid to the airplane industry was politically controversial. After the end of the war, Second World War, the Ministry of Supply was in charge of airplane manufacturing, but the British Government sought to cut back the financial involvement of the state due to the failure of airplane construction programs.

Following this, the British Ministry of Aviation took over the functions of civil and military aviation in 1959. This period was characterized by a system of public 'launch aids', a golden age for public intervention in aeronautical affairs in Great Britain. However, in 1964, the Labour Party changed the contours of the state-business relationship. The principle of state aid to civil aviation remained, and the Ministry of Aviation integrated with the Ministry for Technology. The 1965 the Plowden Report outlined the necessity of a more commercial approach to state aid for civil programs. However, the British civil aviation policy was traumatized by the Concorde program,⁶² which became synonymous with a black hole into which public

money disappeared. This is one of the main explanations as to why the British withdrew from Airbus programs in 1968.

By contrast, the French airplane industry was in a bleak situation at the end in 1945. Factories and equipment had been destroyed and France suffered from technological inadequacies caused by the war. However, after a frantic pursuit of research projects, France made a great recovery, becoming a major player in aviation within ten years. During this period, the state-business relationship came to surface in a most spectacular way.

The French model is characterized by the power the Ministry of Defense exerts over the entire industry, while the Ministry of Transport has become ever more important when it comes to decisions about the launch of civil aviation programs. This was boosted by the launch of Concorde, which made the Ministry of Transport more significant. In 1976 the Ministry of Transport became the body in charge of airplane manufacturing. Technical expertise was located in the French aviation sector. The strong cohesion of the state-business relationship has come as a result of this period.

In Germany, the aeronautical policy reflects the weakness of the industry, which had ceased to exist immediately after the war, and Allied countries raided Germany's leading specialists. Until the end of the 1960s, Germany manufactured airplanes under license, but from 1968-1969 the German government began investing in the Airbus program with the purpose of re-establishing an industrial base in the commercial aviation manufacturing market and reinforcing its link with France. German weakness in airplane manufacture is reflected by the conflicts over Transall, the Franco-German military freight airplane and the problems associated with VFW and Fokker.

ACTOR CENTERED CONCEPT AND CORE COMPETENCIES

In the actor-centered concept, “actors are characterized by their orientations (perceptions and preferences) and by their capabilities” (Scharpf, 1997a, p51). Firms are the core agents of adjustment, facing technological change and global competition and their activities are translated into overall levels of economic outcomes. In the Airbus-Boeing disputes, there are several crucial actors, including two crucial economic actors as well as several major political actors. The two crucial economic actors are Airbus and Boeing, who are tied up in a strategic duopoly competition with strategic interactions. These two firms deploy political leverage on several major political actors including the US government and several EU governments. These political actors are similarly involved in strategic interactions, using political and economic leverage elucidated by the Varieties of Capitalism debate, and a particular approach to political economy, in seeking to advance their interests in the commercial airplane industry.

Firms are seen as actors seeking to develop and exploit profitably (Teece and Pisano, 1998).⁶³ Hall and Soskice (2001) look at core competencies or dynamic capabilities as capacities for developing, producing, and distributing goods and services. In order to solve coordination problems as directly related and crucial to their core competencies, Hall and Soskice (2001, p6-7) argue that firms need to cultivate and develop relationships in five spheres: industrial relations, vocational training and education, corporate governance, inter-firm relations, and their own employees.

As aforementioned, the “Varieties of Capitalism” approach to the political economy is actor-centered in an economy where each actor seeks to advance

his/her own interests rationally through a strategic interaction with others (Scharpf, 1997a). Actor-centered institutionalism (Scharpf 1997a, p36) combines actor-centered and institution centered approaches in an integrated framework. However, the major difficulty with the actor-centered approach is that they must, essentially, rely on intentional explanations that are inevitably based on subjectivities (Dennett 1981; Rosenberg 1988).⁶⁴

GOVERNMENT SUBSIDY DISPUTES BETWEEN THE EU AND THE US

In the on-going dispute, the agential factors are state actors, namely the EU and the US as well as global actors, Airbus and Boeing. The agential factor is the action or political conduct of Airbus and Boeing as actors, and also the WTO as an actor and an arbitrator respectively. The existing political phenomena can be explained by the following structural and agential factors. In the “playing field” where Airbus and Boeing operate, the WTO is the DSM which has procedures and rules to enforce. These are the “structure”, and within this structure, the “agents” (the EU governments and the US government) exist and act. Here, the WTO has more powers than the EU and the US because the WTO is able to relate to the “structure” and enforce the rules. In relation to the WTO, – a structure debate is about how the “structure” (or the rules) makes Airbus/Boeing act in a certain way or how the actions of Airbus and Boeing are able to shape the rules or the relationship between these two, according to the concept of the “agent – structure”⁶⁵.

STATE-BUSINESS RELATIONSHIPS

Three propositions were developed by Susan Strange in 1992. The first of these common roots, are identified as many seemingly unrelated events and developments in world politics and business, which are actually the result of the same structural changes in the world economy and society. The second of these propositions is that the same structural changes have led to fundamental changes in the nature of diplomacy: where there was government-government bargaining, firms now bargain with governments (firms-governments) and with one another (firm-firm). The third proposition is about the significance of firms as actors that influence the future course of transnational relations.

STATE-TO-STATE, STATE-TO-BUSINESS AND FIRM-TO-FIRM RELATIONS

Strange (1992) also argues that governments must face up to structural changes in global politics, particularly to the change in structure of production in the global economy, and pay proper attention to the increasing importance of firms. Her work on relations between states and firms proposes a new agenda: the study of firms as actors in global politics and two new dimensions to diplomacy of state-firm and firm-firm bargaining. She argues that governments must bargain not only with other governments but must also add two new dimensions to diplomacy with firms: state-firm and firm-firm bargaining. These structural changes effect global politics and necessitate the type of bargaining among governments and firms at three distinct levels of relations: government-government; government-firm; and firm-firm. The on-going EU-US government subsidy dispute has effected the global politics of conflicts and cooperation at three defined levels of relations: Airbus-Boeing (firm-

firm) competitive relations; Airbus-EU governments and Boeing-US government (firm-state) relations; and EU governments-US government (state to state) relations. However, it is argued that due to increasingly competitive relations between states that strive for increasing global market shares, such competitive driving forces have compelled states to start bargaining with non-US firms to operate “within territory of the state” (Strange, 1992).

FOREIGN FIRMS AND NATIONAL FIRMS

Strange's view (Strange, 1992) on “foreign” firms and “national” firms which, she believes, should not leave home is obviously an outdated protectionist view. What are the “foreign” firms and “national” firms that Strange refers to? The word “foreign” is rather dated, and has been replaced by “international” several decades ago. For example, Airbus is not called a foreign firm but referred to as a “European firm.” Airbus could be a “national” firm to the French because of the French domicile and because it is made of French/German capital investment. Similarly, Boeing is not a “foreign” firm, nor a “national” firm, but a private “American firm”, undertaking a multi-national business, operating both in the US and in the global marketplace.

Boeing's airplane manufacturing relies heavily on outsourcing with a major focus on assembling airplanes in the US manufacturing sites of Renton and Everett in the state of Washington. Boeing does its own sales/marketing, but has been steadily increasing its outsourcing to Japan since 1970, when the B747 inaugurated its commercial service. There followed profit/risk-sharing joint-ventures with Japan on the B767, the B757, and the B777 programs successively, as well as the current on-going B787 “new generation” airplane program. Boeing has been outsourcing for decades mainly because of the increased cost of US labor and

partly due to the airplane sales concession called the “offset” program that Boeing grants airline customers.

US labor unions have complained about Boeing's outsourcing. The problem with this, however, is that US workers simply priced themselves out of the market decades ago. Therefore, the major portion of airplane manufacturing, including major assemblies, are done outside of the US and are then flown to Boeing's main plants in Renton and Everett in the state of Washington, where the final major assembly takes place and customer specified airplane engines are mounted. This is then followed by flight testing and inspection certified by the US FAA (Federal Aviation Agency).

Susan Strange (1992) supports the view that “bargaining” produces partnerships of alliances between host-states and firms, which is based on the exchange of benefits and opportunities to enhance either party's success in the competition of global market shares. The partnerships are exemplified by long-established business alliances between Japan, the host government, and Boeing, the American firm. Japanese manufacturers and Boeing have collaborated on several risk-sharing joint manufacture ventures, which include the Boeing B767, B777 and the “new generation” B787 airplane programs. The long-term alliance between Boeing and Japan enhanced Boeing's success in Japanese marketplace where Boeing retained major market shares of airplane sales.

Airbus alleged that the Japanese government subsidized the Boeing 787 program. However, Airbus clearly understated its allegation because Airbus's strong allegation on Boeing's business relations with Japan could easily backfire and bring a negative effect on Airbus and EADS's potential business in Japan. Therefore, Airbus was fully aware that it was not politically a sensible move to make a case out

of the Japanese government's subsidy on the Boeing-Japan joint venture as it related to Boeing's "new generation" B787 airplanes.

New technological changes and globalization go hand-in-hand and bring about a "multiplier effect" on the large commercial airplane marketplace. First, globalization of the marketplace has been facilitated by newly developed technological changes such as the advancement of telecommunications, liberalization of trade (toward an eventual elimination of the customs barriers), better access to advanced communications, a better and cheaper air transport network around the globe. Second, globalization further expedited the advancement of new technological changes, facilitated the acceleration of technological development, and also shaped the new business environment.

The two most crucial factors in the success of the large commercial airplane business are the developmental cost of the new airplane and on-time delivery of the airplane. This is mainly because the costly R&D expenditures of the new airplane program and the production time associated with it have gone up dramatically in recent years, meaning that failure in on-time delivery of the new airplane program could not only negatively affect the program, but could also have a negative financial effect on airframe manufacturers.

THE CASE OF AIRBUS – BOEING DUOPOLY⁶⁶

In the previous three decades, Boeing had been dominating the commercial airframe industry. At various points in these decades, the Airbus vs. Boeing airplane subsidy disputes had almost led the EU and the US to the brink of a trade war in large commercial airplane business.

In order to provide a clear insight and a better understanding of the EU's monopoly policy, a clear definition is needed as to what monopoly and duopoly mean in economic terms. An industry with only a few producers is known as an oligopoly; a firm in such an industry is known as an oligopolist. An oligopoly consisting of only two firms is a duopoly and each firm is known as a duopolist. Airbus and Boeing are the case in point. Cini and McGowan (1998) argue that the existence of a monopoly (one firm dominating a market) or an oligopoly (a very small number of large firms dominating a market) may also have a detrimental effect on competition. This certainly includes the on-going duopoly competition between Airbus and Boeing. They support the arguments that dominant firms (either on their own as monopolists, or together as oligopolists including duopolists) can abuse their position, using their market power to cut prices and drive out competitors (predatory pricing) or charging high prices where consumers have little alternative but to pay up. Did the existence of oligopoly or duopoly (two large firms dominating a market) have a detrimental effect on the competition in the large commercial airplane markets?

During the 1980s the large commercial airplane industry was made of three players: Airbus, Boeing, and McDonnell-Douglas. They were the three oligopolists competing for large commercial airplane manufacturing, marketing, and sales. Since 1997 when Boeing merged with McDonnell-Douglas, the large commercial airplane industry has been in duopoly competition dominated by the only two aerospace giants, Airbus and Boeing.

While one firm has a monopoly in the large commercial airplane market, Airbus and Boeing, the two dominant airplane producers nonetheless know that they can affect market prices. Airbus and Boeing are in a situation where both

firms not only compete but also possess market power affecting market prices, hence, the large commercial airplane industry is characterized by *imperfect competition*.⁶⁷

Airbus – Boeing Competing in Prices versus in Quantities⁶⁸

In a duopoly situation, one can assume that firms choose a quantity of output and sell it at whatever the price the market determines. That can be a typical way some markets work. In other markets like automobiles, firms don't set a production level; However, this does not apply to the large commercial airplane industry. For example, Boeing airplanes are made to order to meet airline customers' specifications on their airplanes.

When firms ignore the effects of their actions on each other's profits, they engage in "*non-cooperative behavior*".⁶⁹ In choosing what to do such as choosing a level of output, or choosing a price, "an oligopolist must always be concerned about whether non-cooperative rival firm will respond by undercutting her."⁷⁰ Therefore, in a "*non-cooperative*" *behavior* situation such as a duopoly with only two sellers, Airbus and Boeing, each must take account of the other's expected reactions. Duopoly competition theories conclude two types of competition: Cournot duopoly and Bertrand duopoly.

Quantity Competition or Cournot (Behavior) Duopoly⁷¹

The Cournot duopoly is the two-firm case of Cournot competition – a market situation with only two sellers, each of whom fixes their own output on the assumption that the other will hold the quantity (produced) unchanged. This encourages the change in the production level (the quantity change) as a form of

competition. For Airbus and Boeing, deciding production capacity – how many airplanes they can produce over the next several years – is their most critical decision. This is because large commercial airplanes are large and assembled in batches, a few airplanes at a time in huge hangars: in case of Boeing one hangar in Renton for building one-aisle, standard-body B737 airplanes; the other in Everett for making wide-body airplanes including the B747, B777, and the “new generation” technology B787 airplanes. The critical factors of the monthly production rates on how many airplanes can be built are the size of the existing assembly plant facilities which take time to build, availability of the skilled labor force, and the level of efficiencies for the production of airplanes.

Airbus delivered 434 airplanes in 2005, making it four years straight Airbus has topped Boeing, which delivered 398 airplanes. When Airbus decides to increase its annual maximum production capacity to 450 airplanes per year, Boeing can feel assured that Airbus will not increase its production rates any time soon. This, in return, has important implications prompting Boeing's response and actions. If Boeing also decides on setting its production capacity at 450 airplanes per year, the assumption here is that Airbus's capacity is given, constrained by limited production capacity and that this will result in the market share of 50-50 split between Airbus and Boeing. It was assumed that Airbus would not be able to respond by quickly increasing its output and taking some of Boeing's customers away by offering them a lower price. The result is that the total output of the large commercial airplane industry is less than the output under perfect competition, and each firm earns a profit. This kind of behavior is referred by economists as *quantity competition or Cournot behavior*.

The Cournot assumption, however, is not realistic because over time one would expect the firms to realize that the others do vary their quantities by adopting a more sophisticated forecasting technique. Krugman and Wells (2008) argue that the basic insight of the Cournot duopoly model is that when firms are restricted in how much to produce, they would be able to easily avoid excessive competition and “divvy up” the market, thereby pricing above marginal cost and earning profits.⁷² They also argued that this is because these firms can easily attain an outcome that “looks like collusion without a formal agreement.” So the next question is how do duopolists change their behavior when limited production capacity does not constrain them?

Price Competition or Bertrand (Behavior) Duopoly⁷³

In Bertrand duopoly, each assumes that the other will hold the price unchanged. This encourages the use of price-cutting as a form of competition, particularly if the products are good substitutes. This leads to severe price competition. As price gets driven down towards marginal cost it is hard to see how firms under Bertrand competition could even cover fixed costs.

In a real world, Airbus and Boeing are constrained limited production capacity. Because of the limited production capacity of the airplane producers, when airline customers place airplane orders with Airbus or Boeing, they place billions of dollars worth of airplanes to be delivered over the next several years. For example, in 2008 before the very first test flight of this prototype airplane model had not even completed flight tests, Boeing had already sold over eight hundred copies of the most popular “new generation,” “new technology” Boeing B787 twin-engine wide-body airplanes worth billions of dollars to be delivered over the next several years.

Airbus rival “new technology” super jumbo jet A380 with a triple deck has so far sold about 200 airplanes inaugurating its first delivery with no fanfare in late 2008.

When the economy is strong and many airline customers want to place orders with the duopolist airplane producers, Airbus and Boeing are likely find the number of airplanes they can produce constrained by production capacity – for example, how many airplanes to be built per month depending on the size of the company’s existing production facilities and their manufacturing environment, they are most likely to behave according to the Cournot model and price the airplanes above the marginal costs to earn profits. However, when the economy turns poor, both Airbus and Boeing would not be able to sell airplanes because airlines would stop placing airplane orders with Airbus and Boeing during the poor economic conditions. The worst case scenario is that the airline would cancel airplane orders and stop taking airplane delivery.

In a severe economic recession, airplane producers’ capacity constraints do not come into the picture. Since Airbus and Boeing would have excess production capacity, they are not able to sustain Cournot behavior. Krugman and Wells (2006) argue that as long as each firm finds that it can make additional sales by reducing price, each will continue cutting until price is equal to marginal cost. The case in point is Airbus’s phenomenal sales success in capturing the no-frill, discount airlines such as the Ryanair case. They also argue that further reducing price would cause them to incur avoidable loss. Economists refer to this type of behavior as *price competition or Bertrand behavior*. Krugman and Wells (2006) argue that the rationale behind the Bertrand model is that when firms produce perfect substitutes and have sufficient capacity to meet demand when price is equal to marginal cost,

then each firm will be compelled to engage in competition by undercutting its rival's price until price reaches marginal cost – that is, perfect competition.

Krugman and Wells (2006) further argue that oligopolists would prefer to avoid Bertrand behavior because it earns them zero profits. Firms try to avoid direct price competition – such as producing products that are not perfect substitutes but are differentiated. Airbus vs. Boeing competition is a duopoly, the simplest case of oligopoly. Airbus vs. Boeing duopoly competition is best described by Bertrand duopoly which leads to severe airplane price cutting competition. As compared to a Cournot duopoly, Bertrand competition is closer to the real world of airplane duopoly competition where an airplane price often gets driven down towards marginal cost. In a highly competitive sales situation, airframe manufacturers (Airbus and Boeing) might offer the price package including customer support services, maintenance cost, and flight crew training cost.

The Cournot duopoly assumption is not quite realistic in the case of Airbus vs. Boeing competition. Cournot duopoly assumes that the other would hold the quantity (that the other produces) unchanged. In practice, Boeing produces each airplane in a batch order (made to order only after the orders received from the airline customers).

However, the price of the airplane is not the only airplane acquisition selection criteria. For example, in terms of airplane operating costs, the least operating costs result from an all Boeing airplane fleet or all Airbus airplane fleet instead of a mixed airplane fleet of Airbus and Boeing airplanes. This is simply because the commonality of the airplanes of the same airframe manufacturers enables the purchasing airline to lower the operating costs of the planes including airplane maintenance cost and flight training costs.

THE AIRPLANE SUBSIDY CASE IN THE WTO

Boeing, McDonnell Douglas, and Lockheed were the three major suppliers of US military airplanes and contributed towards the development of new technology and its applications. Military programs for the US, such as the KC-135, paid the costly R&D expenses of the commercial airplanes, like Boeing 707, in the late 1950s. Boeing decided to reinvest \$16 million of the company profits in order to develop the "Dash 80", which became the prototype for the KC-135, the first jet aerial tanker, and then for the 707-120, the first line of Boeing commercial jetliner.⁷⁴ Boeing inherited 707 airframe manufacturing technologies almost entirely from military programs and benefited from the use of already existing manufacturing facilities in (the city of) Renton, in the state of Washington.

Alongside Boeing, the development of the successful Airbus A300 program, the first in a long line of Airbus commercial airplanes, was paid for by European government subsidy in the late 1960s. The A300 was the world's first twin-engine twin-aisle commercial airplane. Like Boeing, Airbus' heavy R&D costs were absorbed by the governments supporting it. Airbus' A300 sales took off in 1970, soon afterward, followed by the A320 and the A310, which was brought to the market in 1983. Airbus was the first to introduce digital fly-by-wire controls,⁷⁵ with the A320 in 1988. Following this, Airbus successfully developed its full product line, including: the A330/A340, the twin aisle family that features wing commonality; the A350 retaining full operational commonality with the rest of Airbus airplane family; and the A380, the super jumbo airplane that brought further development of advanced technologies in an attempt to displace the widely accepted 747 out of the

high-density traffic segment of the market. The US alleges that Airbus developed its entire Airbus fleet with the aid of EU government subsidies.

As previously explored, after the demise of Lockheed in 1981, only three major players were left: Boeing, McDonnell Douglas, and Airbus. McDonnell Douglas operated a business of large commercial airplanes and military defense. However, Douglas Aircraft could not compete with Airbus and Boeing due to its limited line of products – wide-body Douglas DC-10 tri-jets and small-sized, short-distance DC-9 jets.

AIRBUS

Airbus Industrie, the French-based European consortium, was formally established in December 1970 to challenge the dominance of US commercial jet makers. In the late 1960s, Europeans realized that a successful entry to the commercial airplane market would require several European companies to collaborate in order to compete against the American dominance of the industry. Airbus thus began as a consortium of European aerospace companies. In 1967, British, French, and German governments agreed to develop a 300 seat Airbus, the A300.

As Boeing introduced the 747 wide-body jet in 1970, Airbus started with the production of A300 airplanes in the same year, as a French-German consortium company, followed soon after by the A320 and the A310. Airbus has achieved a phenomenal success since its inception in 1970 by increasing its market share of airplane deliveries from 15 percent in 1990 to 57 percent of the market by 2005.

Consolidation of European defense and aerospace companies in 1999 and 2000 allowed the establishment of a simplified joint-stock company in 2001, owned by EADS (80%) and BAE Systems (20%). After a protracted sales process

BAE sold its shareholding to EADS in 2006. Airbus employs around 52,000 people at sixteen sites in four EU countries: France, Germany, the UK and Spain. Final assembly production is at Toulouse (France), Hamburg (Germany), Serville (Spain) and, since 2009, Tianjin (People's Republic of China). Airbus has subsidiaries in the US Japan, China, and India. Over the past four decades it has received orders for thousands of airplanes from 225 world-wide airline customers.

Several factors seem to have contributed to Airbus's outstanding success: production of new technology airplanes; consistent technological innovation; a stable pool of highly skilled manpower; and a concept of airplane families that provides customers with cost savings in crew training, maintenance, and wide-range product lines that serve the various airline customers' needs. Airbus management also states that "international composition of Airbus represents a competitive advantage in the global marketplace".⁷⁶

BOEING

During the early 20th century, four companies emerged and founded the US aerospace industry. They were the Boeing Company, Douglas Aircraft Co., McDonnell Aircraft Corp. and North American Aviation. Three players of the dominant US commercial jet industry, Boeing, McDonnell Douglas, and Lockheed, all had their origins in military airplane production which contributed to the development of advanced airplane technology and its commercial application. By the end of the 20th century, Boeing had become the culmination and consolidation of all these three American commercial airplane technology resources and manufacturing capabilities, which finally merged into one in 1916: the Boeing Company in the Puget Sound region of the Washington state. Boeing became a

leading manufacturer of military and commercial airplanes, and later, after a series of strategic mergers and acquisitions, became the world's largest, diversified aerospace company.

BOEING-MDC (McDONNELL-DOUGLAS CORP.) MERGER IN 1997

In the United States, manufacturing firms become large, multi-unit enterprises by adding marketing and purchasing offices or by way of a merger and/or acquisition.

During the 1980s, the large commercial airplane industry was made of three players: Airbus, Boeing and McDonnell-Douglas. These three oligopolists competed for the manufacturing, marketing, and sales of large commercial airplanes.

McDonnell Douglas, with only tri-jet DC10s and small DC-9 regional jets, was no longer much of a competitor to Airbus and Boeing, both of which had a full product line of commercial jets. Therefore, Douglas only played a peripheral role in the large commercial airplane competition and eventually merged with Boeing in 1997⁷⁷.

The 1997 merger with MDC made Boeing the largest commercial airplane company as well as one of the biggest defense contractors in the US⁷⁸. The 1997 merger of Boeing/MDC was, in fact, the inception of the duopoly competition between Airbus and Boeing. The Boeing/MDC merger filled Boeing's critical need for defense business in military airplanes and weapons systems, which had been controlled by McDonnell. Thus, the 1997 merger of Boeing/MDC finally stabilized the cyclical nature of Boeing's commercial airplane business and enabled Boeing to diversify and increase US government defense contracts on aerospace and military airplanes. As such, since the merger in 1997, Boeing has become a broadly diversified aerospace company, balancing the commercial airplane business and the more stable, long-cycle defense business inherited from McDonnell Douglas.

Since then, the large commercial airplane industry has been in a duopoly dominated by the only two aerospace giants, Airbus and Boeing.

The 1997 merger also provided Boeing with a great deal of business stability, diversification, and dynamic business performance. Prior to the merger, Boeing was susceptible to the business cycles of the commercial airplane business because about 80 percent of Boeing business was in the commercial airplane business and the rest generated from other avenues. Today, 50 percent of Boeing business comes from Commercial Airplanes, 48 percent from Integrated Defense Systems, 2 percent from others, with a better-balanced business mix, generating more than one and a quarter billion dollars a week in operating revenues.

However, the 1997 Boeing/McDonnell merger produced differing views and positions from the EU and the US, and raised a number of controversial economic and legal questions. Differing conclusions have been drawn from this merger between the EU and the US reflect; as outlined by Fox (1998), there are “fundamental differences in the legal philosophies and economic assumptions of the US and European merger-review authorities.”⁷⁹

BOEING’S GLOBAL BUSINESS

In 2007, the Boeing Company achieved records for revenues, cash flow and backlog. Operating revenues rose 8 percent to a total of \$66.4 billion, of which \$33.4 billion or 50 percent came from Commercial Airplanes, and \$32.1 billion or 48 percent from Integrated Defense Systems. Net income grew 84 percent to \$4.1 billion; earnings per share increased by 85 percent; cash flow rose 28 percent to \$9.6 billion; and total backlog increased more than 30 percent to \$327 billion, nearly five times its total revenues of 66.3 billion.

In the recent competition of “new generation” airplanes between the two airplane models, Airbus A380 vs. Boeing B787, Airbus received over 200 orders for the A380, while Boeing sold over 900 B787s. Airbus's super jumbo triple-deck A380, comfortably accommodates 555 to 800 passengers directly from major airport to major airport. However, Boeing argues that the B787 carries 223 – 296 passengers and flies longer distances, directly point-to-point from origin to destination. Furthermore, Boeing claims that the “new generation” B787 offers 20 percent more fuel efficiency. This study finds that Airbus' decision to launch the A380 is based on Airbus' rather optimistic projections of the world passenger traffic demand.

The production problem of the Airbus A380 caused was a great financial setback to Airbus, mainly due to its almost two-year delayed delivery, while the record-breaking sales of B787 positioned Boeing ahead of the game. However, that caused delayed delivery, but was ultimately more of a success, because it appears to have filled the critical needs of airline customers as well as its customers' customers, the travelling public. This is simply because Boeing seems to be offering an airplane most suited to the detailed specifications of what customer airlines need: maximum passenger comfort, environmentally sound, quiet with a further flying distance which will allow passengers to fly directly from origin to destination, point-to-point. Most importantly, from a financial standpoint, the right airplane is the one that provides the best economics to bring the best cash flow results (as well as the superior performance capability of the airplane).

Airbus is currently challenging Boeing by launching a two-engine Airbus A350 airplane to compete directly with the B787. The A350 airplane, has similar seating capacity and operating features to the Boeing B787, and is considered to be

Airbus's hedging scheme that covers a potential risk of billions of dollars. This triggered Boeing's allegation regarding unfair competition: Airbus is building the A350 with the sustained use of government subsidies in direct competition with the B787, Boeing's latest invention in the recent years, expected to be debuted before the end of 2012.

Boeing has argued that Airbus has received about \$40 billion in subsidies over the last three decades and has also received some \$15 billion in launch aid from European governments since 1992. Boeing argues that Airbus has not repaid most of that aid and further suggests that if Airbus had borrowed that money on commercial terms, its parent companies - EADS and BAE Systems - would be \$35 billion in debt. Airbus immediately counter-argued that Boeing has taken \$23 billion in subsidies through government-funded R&D work.

Considering the highly competitive strategic duopoly of Airbus and Boeing, market entry into large commercial airplane industry seems to be virtually closed to any individual firm. Despite this, a corporate takeover of Boeing through merger and acquisition is always a possibility in a free market, however remote such a prospect may seem. Mergers and acquisitions, even hostile takeovers, may become a real possibility if the market valuation of Boeing substantially declines. As Hall and Soskice suggest, "securing finance by large firms depends on their valuation in equity markets, where dispersed investors depend on publicly available information to value the company" (Hall and Soskice, 2001, p27).

It has been argued that Airbus has achieved market share growth, profit growth, and increased production/cost efficiency, equal to or better than Boeing in recent years because of its ability to combine production experience with the aid of continued subsidies from EU governments. By 1995, Douglas' market share was 13

percent, Airbus's 33 percent, and Boeing's 54 percent. Douglas' market share declined further to only 8 percent in 1997, at the time of the Boeing-McDonnell Douglas merger. After the merger, the production of Douglas commercial airplanes continued for a while but eventually discontinued.

THE WORLD TRADE ORGANIZATION (WTO)⁸⁰

As previously outlined, the WTO plays a critical role as the world's dispute resolution mechanism. WTO rules are enforceable and governments are generally prepared to accept penalties but sometimes they defy DSM decisions. In relation to the WTO, the agent–structure debate is about how the (aforementioned) “structure” or rules can make Airbus and Boeing act in a certain way or how the actions of Airbus and Boeing are able to shape the rules or the relationship between these two. The existing political phenomena and ground rules are applied to the “agential factor” – the action or political conduct of two actors, Boeing and Airbus. The most critical issue of the on-going subsidy disputes is that their duopoly competition must take place in a “level playing field” according to the rules of the WTO which has more powers than the EU and the US governments, the two “agents.”

Preliminary rulings at the WTO make the subsidy of the A380 illegal. It is, therefore, expected that the same ruling will apply to the A350. European subsidies to civil aviation are also likely to change in response to the serious US allegation in the WTO on the EU subsidization of the A350 program. Within the context of the international political economy, the two “agents” (the EU and the US governments) are disputing government subsidies, or agential factors, on behalf of

Airbus and Boeing in the WTO, an actor as well as an arbitrator. The agential factor, the action or political conduct of Airbus and Boeing is now under scrutiny in the WTO, which has the structure or enforceable procedures and rules to hand.

The WTO, a multilateral trading system, ensures that trade flows as smoothly, predictably, and freely as possible to promote economic growth and to improve the welfare of the people based on a liberal trade principle. To do that, the WTO performs three major functions among others: administering WTO agreements; providing a forum for trade negotiations; and handling trade disputes. The WTO facilitates freer trade for countries by lowering their trade barriers so that they can produce goods and services for which they have a comparative advantage. The WTO's primary concerns are commercial interest and development. The WTO facilitates trade liberalization and is thus a powerful force in free and positive economic competition by creating jobs and reducing poverty.

SETTING DISPUTES AT THE WTO⁸¹

Dispute settlement is the core mainstay of the multilateral world trading system where the WTO makes a unique contribution to the stability of the global economy. The WTO's procedures make the rules-based system more effective because the rules can be enforced under the rules of law, making the world trading system more secure and predictable.

DISPUTE SETTLEMENT BODY (DSB)⁸²

In the DSB, the first two stages of the dispute settlement procedure are: a consultation mediation between governments which seeks to settle their differences, followed by the appointment of a panel of experts. The DSB is the most

important actor and the law enforcement body of this dispute settlement process. It has the sole authority to establish “panels” of experts to consider the case and to accept or reject the panels’ findings or the results of an appeal. It monitors the implementation of the rulings and recommendations, and has the power to authorize retribution when a country does not comply with a ruling.

Officially, the panel helps the DSB make rulings or recommendations. However, because the panel’s report can only be rejected by consensus in the DSB, its conclusions are often difficult to overturn. The panel’s findings have to be based on the agreements cited and the final report should normally be given to the disputing parties within six months. In cases of urgency, the deadline is shortened to three months. A complete breakdown of the main stages of the panels’ work by target time is detailed in the Exhibit 8 of the Appendix.

THE WTO’S 1994 AGREEMENT ON SUBSIDIES AND THE COUNTER-VAILING MEASURES

After the termination of the 1992 GATT bilateral agreement in late 2004, the EU and the US came up with a negotiation framework at the beginning of 2005 toward developing a new agreement on how to end airplane subsidies. This called for both sides to forge a new agreement based on a restrictive definition of “subsidies” from the WTO’s 1994 agreement on subsidies and countervailing measures. The WTO’s 1994 agreement was a multilateral pact, which was signed by the EU, the US, and more than 125 other nations. This was an important step towards ending subsidies. The EU and the US agreed that both sides would not pursue the litigation at the WTO nor seek new subsidies while negotiations continue and developed a secure and comprehensive new agreement to end subsidies.⁸³

The EU seemed to finally agree on the use of the WTO's 1994 agreement as a basis to form a new agreement on subsidies between the EU and the US. This is the first time both sides had agreed to work towards the end of government subsidies and Boeing observed "Europe's willingness to agree to using the 1994 definition as part of the negotiation framework signals that it may be slowly coming to grips with the idea that Airbus needs to operate on the same commercial principles as Boeing."⁸⁴

APPEALS PROCESS

Either Airbus or Boeing can appeal against panel's ruling. Since Boeing won the preliminary ruling of the on-going Airbus vs. Boeing subsidy dispute case in November of 2009 (and then won again for the last time in late 2011 in the final ruling) it is unlikely that Airbus will appeal against the case at the WTO in 2012. Airbus has the right to appeal against a panel's final ruling but it is highly unlikely that Airbus will appeal against the final ruling of 2011 which ruled in favor of Boeing.

Appeals are strictly based on points of law, such as legal interpretation. As such, appeals cannot re-examine existing evidence or examine new issues. An appeals process is a legal process through which each appeal is heard by three members of a permanent seven-member Appellate Body broadly representing the range of WTO membership.

CONCLUSION

Airbus vs. Boeing disputes reflect the common driving forces from two different political-regimes from Europe and the US, which finally engaged in the government subsidy disputes in Airbus vs. Boeing case at the WTO in Geneva. Both Airbus and Boeing are making great contribution to the balance of payments and economic growth of their countries. Both airplane manufacturers are the country's defense and will be used in case of national emergencies. However, The research finds that there is a distinctive difference in modus operandi between Airbus and Boeing. The EU governments and Airbus clearly take a firm stand, which is different from the US government and Boeing, a private and free enterprise. In fact, Airbus takes a full advantage of getting government subsidies, which are widely accepted in Europe but not quite overtly in the US.

Subsidization of Airbus became a serious threat to Boeing in 2003. Airbus finally overtook Boeing as a market share leader in 2004 with the financial aid of the EU governments. As soon as the news media reported Airbus's new leadership, Boeing initiated a law suit against Airbus by filing complaints at the WTO to prevent Airbus's further attempts to market share maximization efforts. Airbus had no choice but face Boeing's legal complaints at the WTO court and, therefore, Airbus followed suit immediately by filing the complaints against Boeing on the same day.

The European Union and the United States are two dominant players on the global stage. Their relationship roles are critically important in all aspects of global politics and economy by impacting the major political arena around the world. The United States no longer dominates the state-business relationship, while Airbus is critically important in European aerospace industry primarily because the European airplane industry depends on the state industry including all phases and every aspect of aerospace technology. For example, the state-business relationship

is critically important because of the dependence of the British airplane industry on the state.

Boeing decided to take legal actions against Airbus and, therefore, took the case to the WTO to stop Airbus's market share aggression. It seems likely that Airbus was fully aware that Boeing clearly had the legal edge over Airbus in the law suit case, but Airbus had to face Boeing at the WTO. Boeing, being a typical American company, is totally profit-oriented and strives for maximization of wealth for stockholders, while Airbus, a multi-European firm, prioritizes the market share increase at cost instead of profit maximization.

There was no surprise in the preliminary ruling of the WTO as one would expect in a quasi-judicial setting. Boeing took an initiative and brought this case up to the WTO to prevent Airbus from further attempt to increase their market share gain with the continuous financial aid from EU governments. Boeing won a preliminary ruling as expected. Boeing decided to take a legal action against Airbus's continuous use of government subsidies because Boeing seemed to have a solid ground to win the case. Boeing initiated a law suit to prevent Airbus from receiving a financial aid from the EU governments. Airbus had no choice but to follow Boeing and faced the US complaints at the WTO court.

CHAPTER 3

MAKING/MARKETING LARGE COMMERCIAL AIRPLANES

INTRODUCTION

This chapter elaborates on the business strategies of manufacturing and marketing large commercial airplanes in order to provide the context in which the airplane disputes can be analyzed. This it does by: explaining the differing and conflicting views of the EU and the US on government subsidies; elaborating on whether and how the subsidies would seriously harm competition at the expense of the consumers; presenting the EU-US subsidy disputes with focus on the conceptual framework of the international political economy. The chapter also addresses Airbus' recent problems and financial setbacks from the delayed delivery of the A380 that led to the top management shake-up of Airbus and EADS.

As outlined in chapter two, Airbus and Boeing are the "hub of a complex and interdependent web of supplier firms"⁸⁵. For example, Boeing is the hub of the lucrative Japanese marketplace where Boeing has a major market share of the large commercial airplane sales, while Airbus has been trying to break into this marketplace for years. Boeing has a risk-sharing joint venture agreement with three major Japanese manufacturing firms known as "three heavies": Kawasaki Heavy Industries; Fuji Heavy Industries; and Mitsubishi Heavy Industries. They are

Boeing's major outsourcing and joint-venture undertakings for the large commercial airplanes.

Global strategy is critical in the commercial airplane industry, which is global, homogeneous, and highly competitive. The industry is not in perfect competition but has what economists call "increasing returns to scale and huge barriers to entry", characterized by a high fixed cost for R&D development of "new-generation" airplanes. The new Airbus A380's original budget was \$10.7 billion for a one-time R&D cost.⁸⁶ It takes at least 12 years and between \$10 billion to \$15 billion to develop a new airliner from drawing board to test flight. The more orders received, the more widely the huge development cost can be spread, bringing down the unit cost of an airplane. There are also benefits of scope economies in that the technology can be spread across a family of products.⁸⁷

MARKET CHARACTERISTICS⁸⁸

The large commercial airplane market is affected by several factors: passenger demand for air travel; cyclical or seasonal demand fluctuations that affect air travel; domestic and international regulations and deregulations that airlines abide by; and the rate of replacement and obsolescence factors of airlines' airplane fleet. Changes in passenger demand are precipitated and often lead to short-term market imbalances, several factors of which can act as a catalyst: the performance, competitiveness, and strategy of airlines, cargo operators, and leasing companies; external environments under which airlines operate such as political unrest; extraordinary events such as global financial crisis and wars.

Future Economic and Traffic Growth

Passenger demand for air travel is dependent on economic growth. According to Boeing's projection over the next twenty years (2003 – 2022), worldwide economic growth will average 3.2 percent per year; passenger traffic growth will average 5.1 percent per year; and cargo traffic growth will average 6.4 percent per year. Boeing projects that the world's long-term economic prospects remain healthy. According to Boeing, in the short-term, air travel is influenced by economic and business cycles, consumer confidence, and external events. However, in the long-run, economic cycles will smooth out, and GDP, international trade, lower fares, and network service improvement trends will become paramount.

Future Airplane Demand⁸⁹

From 2007 to 2026, Boeing projected that the number of airplanes in service would double from 18,230 in 2006 to 36,420 by 2026.⁹⁰ In terms of airplane demand from 2007 to 2026, airplane deliveries world-wide from 2007 to 2026 will be 28,600⁹¹ new airplanes at \$2.8 trillion delivery dollars, according to the 2006 manufacturers' list prices. Airbus's projection over the 20-year period from 2004 to 2024 is 17,328 new airplanes (as compared to Boeing projection of over 18,000 new airplanes) valued at \$1.9 trillion.⁹² Airbus's projection of market demand for large-sized airplanes led to the development of the super jumbo jet A380 that carries 500 to 600 passengers depending on the seat configuration of airplanes.⁹³

What, with retrospect, would have happened if Airbus decided to develop the new "generation", "high technology" large commercial airplane, the same size airplane as the B747, or perhaps, slightly bigger than the B747? For argument's

sake, it can be called the “Euro challenge” Airbus A400, the European’s direct answer to the B747, with a 400-seat capacity with the basic seat configuration just like the B747, which was originally developed four decades ago. However, this version of the new generation, high technology B747 size airplane could have better fuel burn efficiency with a better direct operating cost, superior to Boeing’s old technology based B747. Therefore, if Airbus had decided to build the Euro Challenge Airbus A400, the result could have been a lot better than that witnessed by the very limited sales result of the A380 with 500 -600 passenger seats – which were developed to capture the market potential with only no more than 200 jets. However, this version of the new generation, high technology B747 size airplane could have a better fuel burn efficiency with a better direct operating cost, superior to Boeing’s old technology based B747. Therefore, if Airbus has decided to build the “Euro Challenge” Airbus A400, directly challenging the B747, its chances could have been a lot better than that witnessed by the A380 with 500 - 600 passenger seats, which were developed to capture the market potentials projected to be about only 200 super jumbo jets with over 500 seat capacity. But, of course, Airbus never challenged the B747 and, thus, the B747’s monopoly in this 400 seat wide-body market segment continues. Thus,

Boeing will finally roll out the first “new generation” “high technology” B787 in late 2012 to start delivering some of more than 900 of the new jets. It will take several years to fill the orders based on a production pace of about ten B787s a month. The B787 is one of the most successful innovations in decades and will soon improving Boeing business and also making a positive contribution to the US balance of payment.

It is expected that the world's commercial aviation will expand to provide long-term opportunities projecting a market value of \$3.2 trillion over the next 20 years, according to Boeing's 2009 annual report. The same report projects an addressable defense, space and security market of nearly \$1trillion over the next five years between 2010 and 2014.

Cyclicalilty

The market of large commercial airplanes remains prone to the cyclicalilty of the global economy and impacts airlines' operating revenues. For instance, airlines can postpone airplane acquisition decisions until the economy improves. In fact, when the economy slows down, customer airlines can delay or even cancel airplane orders and delivery. So far, there has not been any cancellation of airplane orders. However, by contrast, in the economic upswing of 2005, both Airbus and Boeing had a record year for airplane orders. One of the key areas requiring careful management is, therefore, the planned obsolescence and replacement of an existing airplane fleet.

Planned Obsolescence and Replacement of Airplane Fleet

Obsolescence and replacement of the old airplane fleet are major factors affecting the commercial airplane market, according to Porter (1998). Airplane obsolescence is oriented towards the technological obsolescence of an aging fleet which is associated with increasingly higher operating costs and has also been affected by the recent increase in fuel costs.⁹⁴ As the airplane fleet ages, direct operating cost, including fuel cost and maintenance cost of aging fleets, becomes increasingly

higher and results in a higher cost-per-seat for airlines. The oil price hike, if or when it happens, could have a negative impact on the US economy.

Airbus – the Industry Leader

As outlined above, Airbus overtook Boeing in 2003 in terms of market share through airplane delivery, and has been a leader of the large commercial airplane industry for the past several years. Boeing argues that Airbus's sustained use of government subsidies has enabled Airbus to develop its complete family of products from the 107-seat A318 to the 555-seat A380. Boeing also argues that with the aid of government subsidies, Airbus has been able to compete head-to-head with Boeing, pursuing an aggressive marketing strategy toward maximization of global market share in the large commercial airplane industry. In fact, Airbus has captured a major market share of no frill/discount airlines.

Although Airbus and Boeing seem to have an equal status in Europe and the United States in terms of the market share, Airbus is and has become the leader of the large commercial airplane industry.

A private American firm like Boeing will struggle to compete with Airbus if it continues to be financed by European governments. The Airbus vs. Boeing case confirms that the European system works well because no other company except Airbus has been able to take Boeing on and take the leadership away from the most successful American aerospace firm of all time.

MAKING AIRFRAMES⁹⁵

Airbus and Boeing manufacture a complete line of large commercial airplanes⁹⁶ to meet the demands of airline customers as well as the needs of their ultimate

customers, the travelling public. They have developed state-of-the-art technology in making airplanes based on the detailed specifications of airline customers. Both airplane makers deploy sophisticated sales/marketing expertise to stay ahead of the strategic duopoly competition in a global marketplace.

EFFECTS OF SCALE AND SCOPE ECONOMIES

Klepper (1994) characterizes airframe manufacturing as effects of scale and scope economies contributing to the cost efficiency of future airplanes (scope economies) and learning in production (scale economies), outlined as follows:

- Static economies of scale (R&D and start-up investment)
- Dynamic economies of scale (learning in production)
- Economies of scope (learning effects transferred to derivative airplanes)

Economies of scope can be explained by the learning effects transferred to “derivative” airplanes. In other words, the learning effects acquired in the production of original models can influence the marginal cost of producing updated versions of an airplane, the so-called “derivative” models (Klepper, 1994).

“Derivative” Models

When airframe manufacturers develop a new airplane program, its “original” models are always followed by “derivative” models, an extended and improved version of the original models. The “derivative” airplanes tend to get bigger with more seat capacity (than the original) in stretched-model versions, and fly further (long-range

capability) by extended-range or long-range versions. For example, the Boeing 777 is available in six models: the 777-200 (original models); the 777-200ER (extended range) models; the 777-300, the new derivative model of the original -200 models; the 777-300ER, a new extended-range model; the 777-300LR (Long Range), the world's longest range commercial airplane; and the 777F Freighter, an all-cargo airplane model. These effects of "derivative" models can be captured by scope economies, which are the learning effects (of manufacturing the original airplane models), transferred to the manufacture of derivative airplane models.

MARKETING LARGE COMMERCIAL AIRPLANES

While enhancing the quality and effectiveness of airplane performance, large commercial airplane manufacturers deploy product differentiation. Both airplane makers argue that their airplanes are different and better than the other – that is, they engage in product differentiation.⁹⁷

Product Differentiation

According to Krugman (2006), "Firms engage in product differentiation when they try to convince buyers that their product is different from the products of other firms in the industry". In order to be branded, products need to be differentiated (Kotler and Keller, 2009).

In recent years, Boeing has created a basis for product differentiation of the B787's superior airplane performance by marketing 20 percent better fuel efficiency of the B787 than any of the comparable large commercial airplanes in the

market.⁹⁸ Clearly, Boeing seems to have convinced their airline customers that the “fuel efficient” B787 provides airlines with a competitive edge over the Airbus super jumbo A380 and Airbus' new airplane, the A350.

Both Airbus and Boeing go to huge efforts in sales and marketing to convince their airline customers that their airplanes are better equipped than the competitor's airplanes in terms of airplane performance, economics, maintenance, and others. They are thus “creating a basis for differentiation” of products amongst large commercial airplanes, according to Porter (1985).

A highly competitive duopoly between Airbus and Boeing led to a series of product and service differentiations including product innovations and strategies and quality-control processes. In terms of airplane operational capabilities and airplane economics (e.g. airlines' airplane cash flows), both Airbus and Boeing claim better airplane economics (i.e. fuel efficiency), better airplane performance capabilities, better passenger cabin comforts, and so on. Both Airbus and Boeing airplanes are equally well branded and differentiated.

Market Segmentation

Market segmentation is defined as a “sub-division of the market into identifiable buyer groups, or sub-markets, with the aim of reaching sub groups with a particular marketing mix”.⁹⁹ Through market segmentation, companies divide large, heterogeneous markets into smaller segments that can be reached more efficiently and effectively with products and services that match their unique needs.¹⁰⁰ The concept behind “market segmentation” is that markets are made up of different types of customers. For example, within each total market, there exist sub-markets which express distinctive product preference. There are four major variables that

might be used in segmenting markets: geographic, demographic, psychographic, and behavioral variables.¹⁰¹

Large commercial airplane marketing has been more or less based on the geographic segmentation - the US market, European market, Asian market, and others. However, Airbus successfully deployed market segmentation based on the buyer's "behavioral segmentation" variables that - "divide buyers into groups based on their knowledge, attitudes, uses, or responses to a product"¹⁰². Thus, Airbus captured the no-frills, low-cost airline market exemplified by easyJet, which is Britain's biggest low cost airline. Airbus also successfully penetrated the US no-frills, low-cost market, including JetBlue, America West, and Frontier. Boeing alleges that Airbus's deal with the low cost airline market is most likely based on a below market airplane price, possibly a loss leader.¹⁰³

Airplane Fleet Commonality

In addition to the fuel efficiency of the airplane, the commonality of airplanes is one of the most important factors affecting the airlines' equipment acquisition decision.¹⁰⁴ Airplane fleet commonality is referred to as the common features and characteristics of the family of airplanes manufactured by the same airplane manufacturer.

Airbus and Boeing both promote the "family concept" which equates with the fleet commonality, because the commonality philosophy to reduce development costs of the airplanes also provides airlines with substantial savings in flight crew training costs, spare parts and maintenance costs, and aircraft scheduling. In a critical airplane sales competition, airframe manufacturers seem to offer the airline customers the most competitive airplane price (including airplane spare parts and

maintenance cost concessions), to get business in long-term. In the recent past, Airbus has been successful in the price cutting competition allowing it win Europe's no-frills/low-cost operators. Political influence is also deployed to affect the airlines' airplane acquisition decision.

AIRBUS MARKETING STRATEGIES

The strategic goal of Airbus is "to deliver the first-rate economic returns in a sustainable manner by continuing to develop a superior family of products and taking half of the world commercial aircraft market over the long-term."¹⁰⁵ It seems that Airbus could possibly achieve the dominant market share, 65% or higher, with continued use of government subsidies, but this could not perhaps be maintained if heavy political pressures and complaints from US politicians and the US government followed (as it undoubtedly would). So what is the equilibrium market share in duopoly competition?

Airbus's Marketing Focus¹⁰⁶

In order to achieve its stated goal, Airbus actively sought to focus on a number of important areas. These included: "completion of the most comprehensive line of products targeted to customer needs",¹⁰⁷ which required Airbus to deliver the first A380 to customers before the end of 2006 (this was, however, ultimately delayed by two years); gradually extending freight applications (such airplanes are called freighters or all cargo airplanes) to the range of Airbus airplanes; continuously maintaining the existing models' competitive edge in the market; and entering into

military business through new airplanes such as the A400M or the development of military derivatives products based on the A330 airframe.

Airbus also “focuses on key geographic markets”,¹⁰⁸ such as China and Russia, and has consolidated its position in the difficult US airline marketplace, where most of the airlines face financial difficulties when the economy takes a downturn affecting air travel. Further to this, Airbus has sought to “expand its offering of customer services”, which will help enable it to stay ahead in the industry by “best serving customers evolving needs” and “ensuring optimal Airbus placement along the industry’s value chain.”¹⁰⁹ Airbus management is focused on “capturing the benefits of integration to enhance its response to changes in volume and mix and carry out A380 related investments with a strong focus on flexibility and efficiency.”¹¹⁰

Airbus’s Concept of Hub and Fragmentation¹¹¹

Airbus uses the term “hub and fragmentation” to describe the hub and spokes/connection traffic, while Boeing uses a similar concept called the “hub and spokes”. Airbus argues that in the trans-Atlantic market, the development of new non-stop services between secondary cities will drive demand for intermediate wide-body airplanes such as the A330 or the A350. However, Airbus prioritized the development of the A380 designed to accommodate high-density passenger traffic from hub-to-hub airports and compete directly with the Boeing 747. This is because Airbus did not seem to realize that the “new generation” “high technology” airplane, Boeing B787 is “the game changer” that provides a point-to-point direct service instead of an old hub-and-spokes way of traveling through the congested hub airports. Boeing prioritized the needs of travelers and also capitalized on the point-

to-point direct service by the “new generation” B787, which became the hot selling “direct service” high technology airplane.

Despite this, Airbus A380 has been successful in penetrating a high-density passenger market segment. However, the market potential of the super jumbo A380 jets seems to be quite limited. So far, Airbus has sold about 200 A380s as compared to Boeing sales of over 800 B787s. Slow sales of Airbus A380 might set Airbus back several years behind Boeing. While Airbus is building the “new generation” high technology A350 in an attempt to catch up with the Boeing B787, the marketing opportunities of mid-range, medium sized airplanes for direct point-to-point services may have already been captured by the Boeing B787, which is fully booked for the next several years. Airbus argued, however, that it is well-positioned to meet future market requirements with its complete product lines from the 107-seat A318 to the 555-seat A380. Airbus has changed its original marketing blitz of the A380, which is a breathless, colossal-sized, triple-deck super jumbo airplane.

Having realized that “air travel is largely a commodity that is dreaded by anyone who flies frequently”,¹¹² selling the A380 based on its immense size was not an effective marketing strategy, according to some industry critics. Stephen Forshaw, Singapore Airlines’ vice president of public affairs¹¹³ argued that “At the end of the day, it’s what’s on board the airplane that differentiates you.” As such, Singapore Airlines, which is one of the A380 “launch” (or “takeoff”) customers,¹¹⁴ emphasizes the intimacy, personal touches, and amenities inside its passenger cabin.

Airbus A380 Launch Customer – Singapore Airlines

Who is a launch customer? An airframe manufacturer and its key potential airline customers start working together to develop the definition of a particular airplane model they are looking for, which will eventually lead to the development of the airplane specifications, the design of the proto-type model and a mock-up built to scale. Based on the full commitment of the airline, the airplane manufacturer will go ahead and proceed from the proto type to the production stage of the new airplane model. Launch customers - or take-off customers - are the airlines that make a firm commitment and down payment to purchase at least 15 to 20 or more new airplane models before the production stage. Based on the full commitment of launch customers (or what might be called the “green light” in industry circles), the airplane manufacturer will go ahead and proceed from the proto type/mock-up -to the production stage of the new airplane model.

Singapore Airlines installed 471 seats in its A380, about 100 more passengers than the Boeing 747 jumbo jet, but could accommodate as many as 853 passengers in “all economy” seat configurations. Airbus's selling points of the A380 emphasized maximum passenger cabin comfort and smart interiors of the super jumbo plane. However, Airbus admitted later that the earlier, original promotion of the A380 inadvertently focused on the exterior of the A380, such as the big sleek wings and giant engines of the enormous sized A380 super jumbo jet.

The Airbus A380 program was delayed several times. There is nothing unusual about the delayed production of an innovative new airplane program such as the A380, considering the enormous complexity required of airplane manufacturing. However, as a result, its R&D cost of the A380 went up almost 50

percent, well over its \$12 billion budget. Because of this, Airbus shunned its marketing blitz for the A380, but found a new way forward with a low-key marketing campaign message: "Flying full, the plane is more environmentally friendly than a subcompact car."¹¹⁵ The effectiveness of the new Airbus ads on the A380 remains to be seen.

Airbus's Strategies¹¹⁶ for Asia

Sandholtz and Love (2001) argue that there are three primary forces shaping the operating environment of Airbus strategies in the large commercial airplane marketplace in Asia (Sandholtz and Love, 2001). First, there are the technical constraints that exist in building modern large commercial airplanes. Second, there are the fast growing demands of world and regional markets. Third, the structure and objectives of the consortium itself shape the business environment in which Airbus strategies operate.

The outsourcing of Boeing airplane programs to Japan has been very successful and recently Airbus seems to have been following Boeing's strategy. In 2006, it disclosed its outsourcing scheme by building an assembly plant for the A320 in China. It has also reportedly transferred the technology for the manufacturing of wing components for the A320 to China.¹¹⁷ The scale of Airbus' outsourcing to China is not yet comparable to Boeing's long-term full risk-sharing partnership with the three Japanese "heavies",¹¹⁸ and Boeing keeps the major share of the Japanese marketplace. It seems that Airbus has learned that the best way to capture an increasingly large share of the Chinese market is to form a risk-sharing partnership with China, just as Boeing formed a risk-sharing partnership with Japan.

Airbus's Portfolio Mix

Airbus, an airplane manufacturing subsidiary of EADS, generated the operating revenues of 29.97 billion Euro dollars in 2010 and a net income of 1.597 billion Euros. Based in Blagnac, France, a suburb of Toulouse, and with significant activity across Europe, the company produces more than half of the world's jet airliners across Europe.

BOEING'S MARKETING STRATEGIES

Boeing's Direct Expansion

Boeing achieved steady growth through direct expansion for almost three decades from 1970 to 1997 when the merger with McDonnell Douglas took place. This was achieved by increasing commercial airplane sales, expanding production capacity and capabilities, and manpower. Growth strategy is a corporate-level strategy aimed at increasing the level of an organization's operations including quantitatively measurable results such as operating revenues and including sales revenues, manpower levels, market share, etc. Growth can be achieved through direct expansion, vertical integration, horizontal integration and related diversification.¹¹⁹

Vertical and Horizontal Integration

A company has a choice to grow by vertical integration which controls inputs, outputs or both.¹²⁰ Boeing has no vertical integration. In general, Boeing does not employ a hands-on approach to building airplanes from the bottom up choosing instead to have major airplane parts manufactured outside of the US. Boeing calls

itself a “system integrator” rather than an airframe manufacturer. Although Boeing fully engages in the process from drawing to flight test, it is not fully engaged in the various phases of airframe manufacturing¹²¹.

In horizontal integration, a company grows by combining operations with competitors. Boeing has achieved horizontal integration by combining airplane manufacturing operations with its former competitor, McDonnell Douglas. However, the problem with this is that, by definition, combining with competitors decreases competition in the commercial airplane industry – which violates the US anti-trust law, the 1890 Sherman Act. The US Federal Trade Commission (USFTC) is chartered to assess the impact of any such proposed merger, and on the other side of the Atlantic, the European Commission, as counterpart of the USFTC, will pass the final decision. There were some political concessions at both ends of the Atlantic that allowed the 1997 Boeing-McDonnell Douglas merger to go through.

Boeing’s “Core Competencies” and “Market Shaping” Strategy¹²²

Airbus and Boeing have become the most competitive companies in the aerospace industry developing core competencies, detailed customer knowledge specifications and focus¹²³. Hall and Soskice (2001) argue that in order to resolve coordination problems, which are central to their core competencies, firms need to develop relationships in the following five spheres: industrial relations, vocational training and education, corporate governance, inter-firm relations, and their own employees.¹²⁴ Firms seek to develop and exploit core competencies or dynamic capabilities as capacities for developing, producing, and distributing goods and services profitably (Teece and Pisano, 1998).¹²⁵ As Boeing’s 2009 annual report suggests: “Markets” is an active concept. The best companies do more than

respond to market conditions. They shape the markets of tomorrow.” ‘Market Shaping’ strategy is a part of Boeing’s business strategy¹²⁶ and reflects proactive and innovative management. It has been in place for many years¹²⁷.

Boeing Marketing Strategy: Boeing B787 vs. Airbus A380/A350

While Airbus focused on the production and delivery of the A380, Boeing’s major focus was on the development of the mid-size “new technology” airplanes capable of performing point-to-point direct service. Boeing has developed the most innovative, “new generation, high technology” B787 to be delivered late this year in 2012, according to industry sources. Airbus is trying to catch up with the B787 and is currently focusing on the development of the Airbus A350, which is scheduled for completion a few years after the first delivery of the B787 late this year. The B787 is one of the most highly anticipated, inventions to come out of Boeing in recent years, but Airbus’s “new generation” A350 is going to be a new challenger to Boeing’s most fuel efficient, state-of-the art airplane, the B787.

The air travel market is now an open market, and because of this, routes will continue to be broken into fragments, with more passengers flying point-to-point. This is shaping the air travel market by developing and promoting an Air Traffic Management system that will allow point-to-point operations to grow and flourish.¹²⁸ In fact, Boeing established its Air Traffic Management business unit in 2000 in order to create an infrastructure that will enable the commercial airplane business to grow in response to market forces and not to be infrastructure-constrained, according to John Hayhurst, President of Boeing Air Traffic Management¹²⁹.

The B787 is in direct competition with the very successful Airbus A330, currently in service in the large, lucrative 250-seat passenger market. Airbus's "new generation" A350 was expected to counter the B787, but Boeing has denied that it has had any effect on B787 sales. However, according to a reliable industry source, the A350 effect seems to be significant for the following three main reasons:

Being the replacement airplane natural for the A330 with a world-wide customer base, the A350 would capture the existing customer base of the A330;

- (1) Being the replacement airplane natural for the A330 with a world-wide customer base, the A350 would capture the existing customer base of the A330;
- (2) Airbus could charge airlines less to buy the A350 because they could possibly spend less than Boeing did to develop the B787;
- (3) The A350 could make savings in its pilot training cost. For example, the A350 could be designed so that any pilot certified to fly the A330 could also fly the A350 without retraining.

The first Airbus A380, triple-deck super jumbo jet, was delivered to Singapore Airlines, the launch customer. Airbus projected that they could build 200 A380 super jumbo jets to meet the current market demand of the world's largest triple deck jumbo jet. So what accounts for the huge success of Boeing 787 over the Airbus A380?

There are two inter-playing critical determinant factors that carve out the customer airlines' equipment acquisition decision: right airplane in the right

marketplace. Boeing seems to have built the right airplane – the most fuel efficient, mid-sized “new generation” high technology B787 airplane in the right place, which is in an origin to destination, point-to-point marketplace. When Airbus started talking to customers, and eventually committed to the super jumbo A380 with a hub-and-spokes concept, Boeing seemed to have responded by launching the right airplane - the B787 with a completely different philosophy from Airbus A380: the B787 was developed to satisfy the passengers’ critical demand for a non-stop, direct point-to-point service.

When Airbus and Boeing’s long-term projection for the period 2004 to 2024 was released, Airbus’s projection of a much smaller number of airplanes suggested a larger number of large-sized airplanes. It seems that Airbus’s overly optimistic projection led to Airbus’s idea of the A380 jumbo jet, which was supposed to directly challenge the 747. In fact, the 747 has monopolized the 400 passenger seat airplane market for the last four decades.

The rationale behind Airbus’s strategy of building the A380 turned out to be a miscalculation of the airlines’ critical need for mid-sized “new generation” high technology airplane, like the Boeing 787. Clearly Airbus was not fully aware that the market demand had shifted from the old concept of the hub and spokes to the direct point-to-point direct service (from origin to the destination). Therefore, Boeing quickly captured the marketing opportunities for the fuel efficient B787, which best fitted-the specifications of the airline customers. As aforementioned, to counter this mistake, Airbus has begun developing the A350. However, the A350 is three or more years behind the Boeing B787, which has completely sold out for the next several years.

The on-going Airbus vs. Boeing duopoly competition has escalated into a high gear ever since Airbus announced the 555 seat A380 in 2000. The two-year production delays of the A380 in recent years have not only cost Airbus an additional \$3 billion but also have lost them the edge they could have had over the Boeing 787. Meanwhile, Boeing has announced that the B787 will be ready for test flight in late 2012. This has put Boeing a head of the game in terms of the number of airplane orders received, allowing Boeing to achieve its best quarterly profit in four years at \$1.1 billion. Moreover, in the first half of 2007 Boeing's revenues increased to \$16.3 billion, with a 13 percent increase on airplane deliveries from the previous year. Boeing's backlog of orders increased 47 percent, to a record \$208 billion, over seven times the Commercial Airplane Group's 2006 revenues.

Airbus made an optimistic market projection of the super jumbo A380 airliner marketplace. The Airbus "new generation" super jumbo A380 was originally meant to be Airbus's serious challenge to displace the Boeing 747 airplanes which had been monopolizing the high-density passenger market sector for almost four decades. However, Boeing quickly responded by directly challenging the A380, (which is the hub-and-spokes airplane), by marketing the fuel efficient two-engine B787, which became the best seller airplane that can provide the direct point-to-point service.

Boeing proved to be right about marketing the B787 airplane. In fact, the passenger preference and the modern air travelling trend seem to have shifted considerably from the old hub-and-spokes way of travelling to the new way of travelling direct point-to-point which brings substantial savings in total transit time exemplified by the B787, according to Boeing. This provides not only substantial savings in total transit time but also a high level of passenger cabin comfort with

more oxygen. Therefore, the “new generation” B787 became the best selling “direct service” high technology airplane.

The B787 also directly challenges the very successful Airbus A330 currently in service in the large, lucrative 250 seat passenger market. Airbus's “new generation” A350 was expected to counter the B787, but Boeing has denied that it has had any effect of the A350 impact on the B787 sales.¹³⁰ The B787, made largely of carbon fiber composite, is worth more than \$114 billion in sales with over 900 orders from more than 50 customer airlines and is completely sold out until 2015 delivery. However, while Boeing denies any impact of Airbus A350 strengths on the B787 sales, the A350 seemed to be significant.¹³¹

Boeing's Business Strategy¹³²

Boeing continues to improve its performance in the immediate and long term – over the next five to ten years - targeting both accelerated growth and improved margins of cash generation.¹³³ Boeing's business plans are consistent with its strategy to operate as the leading broad-based aerospace company.¹³⁴ According to Boeing's 2007 annual report, it is “selectively developing in-house capabilities that, when combined with the best of the industry, meet the enduring needs of the customers and enhance its strategic position in a competitive marketplace.”¹³⁵ Its continued focus on transforming the commercial airplane business brought a dramatic upsurge in new orders and strong financial results.¹³⁶ Boeing was a leader of all major US aerospace companies in terms of share-price appreciation during 2005 (see Exhibit 3 in the appendix for a summary of Boeing's five-year 2001-2005 financial results).

Two-Year Delays of Boeing's "New Generation" B787

Recent manufacturing problems of the B787 delayed its flight-testing by four months. Boeing initially insisted that it would deliver the first B787 in May 2008 as promised, is suggesting that it was possible to overcome the four-month delay to meet the delivery target of the first jet. However, Boeing then announced that the schedule was tight and they needed to have about 42 airplanes ready for delivery by the time the test flight program was completed.¹³⁷ Delays threatened to disrupt the production schedule for up to two years, jeopardizing Boeing's credibility with its airline customers and leaving Boeing exposed to hefty penalty payments. Boeing insisted that the delay would not have a major impact on Boeing's financial projections, even if the delivery delays were as great as four months. It has since reserved almost \$2 billion for an additional research-and-development fund to help cover additional costs associated with the B787 delays.¹³⁸

Boeing's Portfolio Mix

Boeing was not a major defense company back in 1995 when its commercial airplane business accounted for 71 percent and the Integrated Defense Systems 29 percent of the total operating revenues of \$19.5 billion.¹³⁹ Since the merger with McDonnell Douglas in 1997, Boeing has become a well-balanced company with the right mix of a large commercial airplane business and military defense business. Between 1995 and 2007, Boeing became an aerospace company exhibiting strong growth, more than tripling its total operating revenues of \$19.5 billion in 1995 to \$66.4 billion in 2007.¹⁴⁰ Commercial airplanes generated \$33.4 billion in 2007 accounting for 50 percent of total revenues. Its integrated defense systems totaled \$32.1 billion, accounting for almost half of its total revenues. Boeing has positioned

itself to achieve long-term growth by increasing company's sales, production capability and manpower to meet the demands of airline customers.

CHAPTER 4

THE TERMINATION OF THE 1992 EU-US AGREEMENT

INTRODUCTION

This chapter explains the 1992 GATT agreement, examines EU-US trade relations, and investigates the trail of events that led to the termination of the 1992 EU-US bilateral pact in 2004.

In October 2004, the US government filed the WTO case against the EU over unfair Airbus subsidies. The US alleged that launch aid and other government support to Airbus qualifies as a subsidy under the agreement on Subsidies and Countervailing Measures (SCM) and that such subsidies are “actionable” giving ground for a lawsuit because they cause adverse effects or are “prohibited” because they are export-contingent. The 1992 bilateral agreement does not preclude the United States or the European Commission from taking a case to the WTO. The terms and obligations of the 1992 bilateral agreement are separate and distinct from the terms and obligations of the 1994 SCM Agreement.

What were the deficiencies and deficits of the 1992 GATT bilateral agreement between the EU and the US? Should the agreement have been amended? Do Airbus and Boeing need a new bilateral agreement to ensure a “level playing field”? By October 2004, after 12 years, the US believed the 1992 agreement had outlived its usefulness and terminated it. After the US pushed the

EU to revise the bilateral agreement on airplane subsidies, both the EU and the US filed complaints at the WTO.

THE 1992 GATT AGREEMENTS AND THE 2004 TERMINATION

The 1992 GATT bilateral agreement between the EU and the US allowed “reimbursable launch investments” of up to one-third of the total research and development costs of new large civil aircraft programs. “Reimbursable launch investments” used by Airbus, refers to the launch aid which is typically given by European governments. Airbus argues that this type of government funding is typically a Department of Defense and NASA (National Aeronautics and Space Administration) mechanism used in the US.¹⁴¹ In the United States, manufacturing firms become large, multi-unit enterprises in two ways: by adding marketing and purchasing plants, or by way of a merger, according to Chandler.¹⁴²

The case of the 1997 Boeing/McDonnell merger demonstrates the differing views and positions of the EU and US on the merger, including: identifying and explaining the antitrust law enforcement agencies of the EU and US government. When Boeing merged with McDonnell-Douglas in 1997, Boeing became the only commercial airframe manufacturer in the US that produced a full product line of commercial jets in various sizes, from the short, medium, to long-range flight capability.¹⁴³ Boeing, however, is not the European equivalent of the “national champion” manufacturer invested in their national interests. The US government adheres to the principle of free competition and remains hands-off from the publicly traded American companies like Boeing.¹⁴⁴

The European Commission approved the merger of Boeing with McDonnell-Douglas in 1997 on the condition that Boeing license to Airbus any government-funded patent that could be used in the manufacture or sale of large civil aircraft.¹⁴⁵ However, Airbus has made no commitment to sharing any government-funded technology available with Boeing. Therefore, the US sought a mutual commitment to share any government-funded technology from either side in a new bilateral trade agreement.

Airbus feared that the overspill resulting from Douglas's experience with defense production and related research and development would enable Boeing to increase its commercial airplane business.¹⁴⁶ Moreover, Airbus objected to Boeing's exclusive 20-year contracts with three US airlines: American Airlines, Delta Airlines, and Continental Airlines. Because of this, Airbus threatened to retaliate against Boeing, and consequently, Boeing agreed to meet Airbus's demand not to seek exclusive agreements with those three airlines. The Boeing/Douglas merger exemplified the "political-economic linkages"¹⁴⁷ and "major political implications"¹⁴⁸ in the merger decision of two American multi-national companies.

1992 GATT Agreement

The EU-US non-aggression pact on trade and civil aircraft limited the participating government subsidies to one-third of total research and development expenditures.¹⁴⁹ Under the terms of the pact, Airbus received government loans on preferential terms and Boeing carried out government-funded research. The agreement did not encourage competition, but it allowed both sides to continue the level of subsidies that had been agreed upon, according to Mandelson, the Commissioner of the EC.¹⁵⁰

However, the 1992 GATT agreement worked well in principle but it did not work well in practice for two reasons. First, no clear definition was provided nor agreed to as to “indirect support”. Second, the agreement was not enforceable. There was no agreement as to enforce any provisions of the agreement and relied on biannual meetings to review publicly available information on direct and indirect government support. The term “launch aid” was not even clearly defined.

Although Airbus argued that the 1992 GATT bilateral agreement provided a level playing field for government support, reflecting the needs of both Europe and the US, it was thought that the GATT bilateral offered Airbus a strategic advantage over Boeing. This is because the bilateral pact not only legitimized but also institutionalized Airbus’s government subsidies that accounted for the thirty-three percent of the total research and development costs.¹⁵¹ After twelve years of continuous EU government subsidies under the 1992 bilateral agreement, Airbus was able to succeed in taking the leadership away from Boeing, prompting Boeing to file the WTO case against the EU in October 2004.

The 2004 US Termination of the 1992 Bilateral Agreement¹⁵²

The United States exercised its right to terminate the pact by filing the WTO case against the EU over unfair subsidies. The European Union immediately responded to the US action and also filed the termination of the 1992 bilateral pact on the very same day the US filed the case.

The US allegation was that launch aid and other government support to Airbus qualified as a subsidy under the Agreement on Subsidies and Countervailing Measures (SCM). The 1992 bilateral Agreement does not preclude the American officials or the European Commission from bringing a WTO case as the terms and

obligations of the 1992 bilateral Agreement are separate and distinct from the terms and obligations of the 1994 SCM Agreement. Compliance with one is not a defense against claims of non-compliance with other.

The first step in the WTO process is to file a request for consultations, which begins after a period of no less than 60 days, allowing the parties to consult in an effort to resolve the case. In the Airbus-Boeing case, after 60 days the parties were unable to reach an agreement, and the US was authorized to request that a WTO panel be established to begin with the fact findings. This is consistent with the United States' view that it was time to end Airbus's new subsidies by the filing of the request at the WTO. The US Trade Representative, Robert Zoellick called for fairness and free from government subsidies as follows: "This is about fair competition, and a level playing field. Since its creation thirty-five years ago, some Europeans have justified subsidies to Airbus as necessary to support an "infant" industry. If that rationalization were ever valid, its time has long passed. Airbus now sells more large civil aircraft than Boeing."¹⁵³

Europe and the US both recognize the value and appropriateness of the WTO process as a means to resolve trade disputes. The US had been urging the EC (European Commission) to negotiate a new agreement to replace the 1992 EU-US bilateral agreement on Large Civil Aircraft. Europe and the US have worked closely together on many economic and trade fronts, and most importantly on the advancement of trade liberalization in the Doha Round negotiations. The WTO was created to serve such purposes, and Europe and the US have since brought about a number of dispute cases against each other at the WTO; for example, in the area of agricultural trade which has been another area of considerable trade tensions. Zoellick, the US Trade Representative (USTR), also made the following comments,

asking the EU to provide no new airplane subsidies to airplane manufacturers in compliance with WTO rules: “We urged the EU to agree that neither of us should provide new subsidies to aircraft manufacturers. We offered to simplify our task by using the subsidy definition that the EU and the United States had already agreed to in the WTO. We even were willing to accept subsidies in the pipeline – but then draw the line. That’s a fair offer [...]”. Then Zoellick announced the US government’s decision to pursue a resolution with a dispute resolution panel at the WTO: “... since we could not agree, the United States decided to pursue resolution through the agreed procedures of the multilateral trading system, by a WTO case before an international dispute resolution panel.” The US’s decision to pursue a resolution by a WTO panel may or may not be the right course of action. However, European counterparts, EC representatives and Airbus attorneys appeared with the US attorneys representing Boeing and the USTR (US Trade Representative) Robert Zoellick at the WTO hearing in Geneva.

The 2004 US’s Allegations and Assertions¹⁵⁴

According to the official complaints filed by the US at the WTO, the American government alleged that European governments provided loans to Airbus on non-commercial terms at much better terms than Airbus could get in the commercial market. The US also alleged that European governments provided government funding for A380-specific infrastructure improvements, such as runway extensions, factory facilities, etc. The Americans also alleged that Airbus has benefited from the European governments’ “forgiveness of debt”, including substantial amounts of its “repayable” launch aid. Airbus had been directly aided by significant grants and equity infusions from European governments.

The American government claimed that the real issue here was that every time Boeing developed a new airplane it assumed full market risk, while Airbus did not. This was because the most distinctive difference between Airbus' and Boeing's business practice was that Boeing operated on commercial market-dependent practices, while Airbus conducted its business based on government-subsidized practices. Therefore, American officials asked that Airbus work on the same set of free competition rules and that launch aid for Airbus would end immediately.

Boeing's new airplane program, like the "new generation" 787 airplane, had the option of being funded either through corporate profits or by financing the program at commercial rates from commercial banks. Airbus, however, received money upfront in the form of launch aid, on special non-commercial terms from European governments. While Boeing had to return its loans from commercial banks on time at commercial rates regardless of whether an airplane program was successful or not, Airbus had the luxury of repaying its launch aid only if the subsidized airplane program became successful and profitable.

Under Airbus's loan agreements with European governments, the first repayment threshold kicked in only when airplane sales reached 40 percent of the target total sales. Airbus started paying back the loan, but all that was due back at that point was 20 percent of the total launch aid for a given airplane. For example, by 2011, Airbus had received nearly \$4 billion in launch aid for the "new generation" 550-seat A380. It had projected a market for 1,500 A380s, so had to sell 40 percent of the 1,500 A380s (or 600 A380s) before it needed to pay back 20 percent of the \$4 billion launch aid received. So far, Airbus had sold just over 200 A380s. It was estimated that the market for the A380 was much smaller than the 1,500 A380s projected, and it was unlikely that the market was big enough for Airbus to be able

to sell 600 A380s. Therefore, according to Boeing, the European airplane maker never needed to pay back any of the \$4 billion in launch aid for the “new generation” triple-deck “super jumbo” A380. It has further argued that Airbus had borrowed an incredible amount of some \$15 billion in launch aid, which was a no strings attached government loan, but Airbus has not repaid most of that aid¹⁵⁵.

As a result of these sustained government subsidies, Airbus made great progress and developed a full product line in record time, achieving market share parity with Boeing in 2004; and yet, continued receiving massive government subsidies. Boeing brought the allegation of these government subsidies to the US government, and asked the American officials to facilitate the end of Airbus's launch aid. American government officials opened dialogue with their European counterparts about the market distortion effect of European Union government subsidies on the Airbus-Boeing competition. This is because only governments have the authority to take necessary action on trade-related issues between governments.

The American government complained that Airbus had benefited from taxpayer-funded “launch aid” that had helped Airbus develop every new airplane.¹⁵⁶ The Americans argued that this had given Airbus an unfair advantage over Boeing, because these subsidies had allowed Airbus to unfairly speed up the development of a full product line of large commercial airplanes.¹⁵⁷ Further, partly because of the direct support and loans that Airbus had received on preferential terms from European governments, Airbus was able to undercut Boeing airplane prices, thus taking unfair advantage in the marketplace and, consequently, harming the US aerospace industry. The American government claimed that Airbus had received about \$40 billion (£32.6 billion) over the last three decades from when the disputes

were launched.¹⁵⁸ Boeing calculated that Airbus had received at least \$15 billion in a government aid from Germany, France, Spain, and the UK since 1992. However, the EU argued that Airbus has already repaid \$6.5 billion.¹⁵⁹

The strength of the American government's argument was based on the fact that the European governments' soft loan to Airbus, worth \$4 billion dollars in launch aid, amounted to about \$40 billion over the last thirty years.¹⁶⁰ The implication of this is that the European governments' subsidies to Airbus placed Boeing, a private US firm, in competition with the unlimited financial resources of European governments.

THE EU's ALLEGATIONS AND COMPLAINTS

The EU countersuit filed with the WTO alleged that the financial incentive packages passed by the states of Washington and Kansas for the development of the B787 airplanes constituted a subsidy to Boeing.¹⁶¹ In addition, the EU complained that Boeing benefitted significantly from research and development contracts with NASA and the US Departments of Defense and Commerce. The European Union also alleged that Boeing illegally benefitted from tax breaks under the now-repealed FSC (Foreign Sales Corporations) tax program, as well as from research and development tax credits, from the US government.

The EU further claimed that the US government had provided Boeing with \$23 billion (£18.66 billion) in subsidies since 1992, largely through government-funded R&D (research and development) contracts from NASA, the Department of Defense and the Department of Commerce.¹⁶² In addition, the state of Washington

and other local authorities had also provided \$3.2 billion in tax incentives for the “new generation” Boeing 787 airplane after Boeing agreed to keep the final assembly of the new airplane in the Washington state.¹⁶³ The EU also claimed that Boeing had benefited from cross-subsidization by way of technology transfers from state-of-the-art military airplanes to commercial airplanes.

THE EU-US DISPUTES OVER FOREIGN SALES CORPORATIONS (FSC)

In 2000, the EU asked the US to “adjudicate on the so-called Foreign Sales Corporation (FSC) dispute”¹⁶⁴ (or judicially determine the FSC dispute). The FSC was an American law taxing American exports more favorably than production outside of the United States¹⁶⁵. Consequently, the EU alleged that Boeing benefitted from a tax break from the FSC.

In 2003, the WTO ruled that the FSC, the Foreign Sales Corporation, was illegally benefiting American exporters and authorized the European sanctions.¹⁶⁶ In fact, Boeing was the biggest beneficiary of the FSC tax breaks. However, the EU left Boeing off its sanction list because many European airlines are big customers of Boeing and they did not want to “shoot” their own operators in the “foot”¹⁶⁷. The US Congress adopted legislation that scoops up new tax breaks to a wide range of American businesses in return for doing away with the FSC. Boeing appeared to receive FSC benefits for far longer, because the airplanes that had already been ordered were providing a legal protection of prior rights from the effects of a new law. Therefore, European officials were to determine for how many years and by how much Boeing had benefited from the FSC tax breaks. The

Europeans claimed that the FSC continued to benefit Boeing to the tune of \$200 million annually.¹⁶⁸ The EU contended that these subsidies had significantly helped Boeing and had harmed Airbus.¹⁶⁹ The allegation was that “the effect of the measure was significant price suppression and lost sales.”¹⁷⁰ The WTO ruled that the tax break from the FSC constituted an illegal export subsidy and ordered the Americans to rewrite its tax law. The WTO authorized the EU to collect as much as \$4 billion in retaliatory sanctions from the US companies.¹⁷¹

Regarding the allegations made from on both sides about the subsidies Airbus and Boeing received, neither side has given up the subsidies to date. The 2004 Geneva meetings provided an opportunity for the European and American governments to seek answers to questions about each other’s assertions and allegations. Both the Europeans and the US have expressed interest in the continuation of consultations, but it is clear that there exists a significant division between the European and American governments. However, there has been a “notable shift of European thought” about airplane subsidies, said Ted Austell, Boeing Vice President of International Trade Policy. “Increasingly, recognition is growing in Europe that a mature and profitable company like Airbus no longer needs to be propped up by government funding.”¹⁷²

The fact remains that under WTO rules, the airplane subsidies are illegal. However, the 1992 bilateral agreement allowed Airbus to continue to secure new launch aid for the A380 or any new airplane program whenever Airbus wanted. According to Austell, Boeing’s VP, “without the cover of the 1992 agreement, it is inconceivable that Airbus could successfully solicit new launch aid it might seek for the A350 or any other program”; he further adds, “We believe that the launch aid that has been historically disbursed just does not conform to international trade

rules. That puts Airbus and its sponsor governments in a vulnerable position.”¹⁷³ According to the industry officials in the US, while clear differences existed on the issue of subsidies between the EU and the US, the two sides continued working out the differences by exchanging information. The early November, 2004 meetings in Geneva kicked off the first step in the WTO’s consultation procedure¹⁷⁴

THE WTO CASE ON AIRBUS SUBSIDIES

Over its 35 year history, Airbus has benefited from a substantial infusion of funds from EU member states and EU subsidies that allowed the company to develop a full product line of commercial airplanes and gain a 50 percent share of large commercial airplane sales and a 60 percent share of global airplane orders. This is simply because every single major Airbus airplane model was financed, in whole or in part, by EU government subsidies taking the form of “launch aid” – that is, so called “soft loans” in US financing terms, with no or low interest rates and repayment contingent upon the success of sales of the airplanes. In fact, EU governments have in the past forgiven Airbus’s debt, provided capital infusions and infrastructure support, and provided substantial amounts of research and development funds for commercial airplane programs.

Since 1985, the United States has conducted several major rounds of negotiations with Airbus partner governments and the European Commission with the objective of achieving greater disciplines over the subsidies provided to Airbus. In 1989 and 1991, the United States brought two cases to the GATT challenging Airbus subsidies. The first case involved challenging a German program that offset

adverse exchange rate fluctuations on sales of Airbus airplanes: this ended in a victory for the United States after a GATT panel determined that the exchange rate scheme constituted a prohibited export subsidy. The European Commission blocked adoption of the panel report, which was permitted in the old GATT agreement before the creation of the WTO, but Germany subsequently withdrew.

The second case was a broader case that challenged overall subsidies to the Airbus consortium. This was withdrawn in July 1992 after both sides negotiated a bilateral agreement limiting government support for large civil aircraft programs. This agreement prohibited future production support and limited the share of government support for the development of new airplane programs to 33 percent of the project's total development costs¹⁷⁵.

The United States expected the 1992 agreement to lead to a progressive reduction of subsidies. Instead, the 1992 agreement became a legitimate instrument to be used as an excuse for EU governments to continue subsidizing Airbus¹⁷⁶. The \$3.2 billion launch aid that EU governments have committed for the new Airbus A380 is the largest amount of funding committed to a single airplane program. The EU has since provided further loans and infrastructure that has pushed the total amount of A380 subsidies to approximately \$6.5 billion to date. Airbus also plans to launch the A350 to compete directly with the most successful B787. While Airbus intended to request subsidies for the A350, the American government made major efforts to oppose Airbus's subsidies and the United States specifically opposed the subsidized financing for the A380.

NEGOTIATION OF NEW BILATERAL AGREEMENT

The United States government made major efforts to address the issue of subsidies to Airbus from 1999 - 2000, when it specifically sought to oppose subsidized financing for the A380. At that time a possible WTO case was considered but Boeing did not support the option for its own business reasons. Consequently, the Clinton Administration dropped the option of a possible WTO case. One of the key reasons for not pursuing the WTO case at the time was that the 1992 GATT agreement was still in force and Boeing sought a negotiated settlement first. Litigation against Airbus seemed to be the last resort at the time and therefore, Boeing did not take it to court until 2000.

However, the issue of Airbus subsidization became more pressing in 2004 when Boeing faced the critical issue of Airbus's new subsidies for the A350, as Airbus's market share continued outpacing Boeing's in terms of number of airplanes delivered. Consequently, the United States Trade Representative (USTR) Robert Zoellick continued dialogues about ending new subsidies with EU Trade Commissioner Pascal Lamy in late spring and early summer 2004. The personal relationship between Zoellick and Lamy was exceptionally good and this may have facilitated discussions. USTR and EU trade officials had meetings in July and September in order to secure a commitment to end new subsidies. In August 2004, President Bush instructed Zoellick to pursue all possible avenues to end Airbus subsidies, inclusive of an option of the filing a WTO case. Subsequently, USTR sought to end subsidies through the negotiation of a new bilateral agreement. However, the EU remained unwilling to agree on the goal of ending all new subsidies, and much less on how to achieve this goal. Zoellick met with EU Trade

Commissioner Lamy on September 30, 2004 to discuss ending the subsidies, but without resolution.

The US remained committed to resolving the question of subsidies to Airbus through the negotiation of a new bilateral agreement. However, considering the EU's unwillingness to end subsidies through negotiations, filing a WTO case was imminent and quite necessary to ensure, one way or another, a move to level the playing fields.

Some critics saw Boeing's termination of the accord as a strategic management option to pressure Airbus to delay the "launch aid" to redesign.¹⁷⁷ Its new long-range A350 would directly compete against Boeing's "new generation" B787. The subsequent discussions between the US and the EU governments did not result in agreement: as Boeing Commercial Airplanes President and CEO Alan Mulally stated that "the intent of the 1992 bilateral (agreement between the United States and European Union) was to reduce launch aid. Clearly Airbus has institutionalized launch aid. So it's appropriate that the United States terminated the agreement for cause and is asking Europe to renegotiate the agreement." Mulally also stated: "The goal is to negotiate a new agreement, or for everybody to move toward operating in the framework established by the World Trade Organization - which doesn't support Airbus launch aid."shared He supported the view that the EU and the US move toward a more rule-based trading framework.

Boeing stated that the company fully supports the action taken by the US government after unsuccessful government-to-government attempts to resolve the issue. "It is clear that the 1992 agreement does not reflect current market realities and has outlived its usefulness," according to ex-Boeing President and CEO Harry Stonecipher. Boeing took the view that Airbus subsidies were leading to market

distortion in the commercial airplane marketplace. Boeing shared the US government's view that EU subsidies to Airbus must cease and that competition in the large commercial airplane market must not be distorted by such subsidies.

FRAMEWORK FOR NEGOTIATIONS

January 11 2005 was a critical date in the ongoing disputes between EU officials and the US trade representatives.¹⁷⁸ That day, officials from the two governments agreed to create a framework which enabled the continuation of negotiations to end government subsidies for commercial airplane development and production. The agreement for this round of negotiations was that both sides would spend 90 days¹⁷⁹ negotiating to end subsidies. This included three main objectives: ending subsidies to airplane manufacturers; creating a bilateral agreement between the European Union and the United States; and creating an agreement with strong transparency and enforcement mechanisms.

However, at the end of the 90 day negotiation period, the two governments had not reached an agreement and there was no indication of what would happen next. The US government stated that it was willing to continue talks under the terms of the January 11 agreement, and Boeing agreed to provide full support to the US government's efforts to end subsidies to Airbus. The US Trade Representative's office also made a statement that in the event that the EU proceeded with additional subsidies for Airbus large civil aircraft, the United States would return to the WTO dispute settlement mechanism.¹⁸⁰ However, in direct response to the Americans, Airbus went straight to the press and announced that it

would seek launch aid from its sponsor governments for its proposed A350 airplane. Despite an intensive negotiation just concluded, the EU and the US had not reached an agreement to eliminate such aid.

One reason for the lack of progress on the issue of launch aid was the fact that the EU governments seemed to take actions which entirely contradicted the three key objectives agreed upon by the two governments for the negotiating period. A large part of the problem was that the EU is not a government. Despite a moratorium on new subsidies that the EU officials agreed on, then-Airbus CEO Noel Forgeard clearly stated that Airbus would seek launch aid from its European sponsor governments for its proposed A350 airplane.¹⁸¹

Although the European Union initially agreed to bilateral talks only with the United States government, to be followed at a future date by talks with other nations as appropriate, the European Union invited Japanese participation into the negotiations before the European Union and the United States had a chance for substantive discussions.¹⁸² The Japanese declined the invitation and the reason why was not disclosed.

Once the January 11 2005 agreement expired after 90 days, former US Trade Representative Robert Zollick wrote a letter to the European Union Trade Commissioner, Peter Mandelson, asking for clarification on the Europeans' position on the dispute, the negotiations and the agreement between the two governments made on January 11 2005.¹⁸³ Zollick asked if the Europeans were "willing to continue to negotiate under the terms of the January 11 2005 agreement, including the standstill on subsidies."¹⁸⁴ Mandelson's response to this was not revealed, but he apparently supported the view that Airbus no longer needs government subsidies.

Clearly, Airbus's sustained use of government subsidies represented a widely accepted business practice in Western Europe and other parts of the world. However, Mandelson's decision that Airbus no longer needed subsidies signaled an advisory mandate to Airbus to operate on free enterprise principles without governmental aid. Mandelson directed the European Union to accept that government subsidies for commercial airplanes should be ended instead of going through the prolonged settlement procedures of the WTO.¹⁸⁵

Mandelson's decision is consistent with the subsidy-neutral principles of free trade and fair competition of the world trading system. His decision was influenced by his experiences in the on-going EU-US subsidy disputes and his background as a member of the New Labour government in Britain. However, Airbus may or may not agree with the same American principles as Boeing that ending subsidies brings fair competition, develops the most competitive airplanes, and creates long-term jobs.

There is no clear indication of whether Mandelson's decision (that there is no need for subsidies) reflects a major shift in EU policy on airplane subsidy issues or if it is/was an expression of his own personal stance. However, it could be seen as a clear sign of Europeans' understanding of the political-economic necessity for a departure from old EU trade policy. Whether the dialogues between the EU and US will bring about a major political shift in EU policy depends on the determination of the US to put political pressure on Europe about its attitude towards sustained use of government subsidies.

What were the core factors and driving forces influencing Mandelson's position on subsidies? The US was most likely to win the WTO case if or when the US took action to litigate this through the Dispute Settlement Mechanism (DSM)).

Mandelson's view was further confirmed by the US government's clear message to end subsidies. Boeing made concerted efforts with the US and reiterated its strong support for the US's efforts to end Airbus's launch aid, either through a continued negotiated settlement or litigation at the WTO. Mandelson was arguably correct in his view that Airbus should no longer need government subsidies.

The EU Trade Commissioner Peter Mandelson's view seemed to reflect the Zeitgeist of Europe's general consensus, in line with the WTO rules, that there is no need for continued government subsidies. Accordingly, senior Airbus officials had been reiterating that Airbus had the funds to develop the A350 without launch aid. However, contrary to Airbus officials' public statements like "no need for government aids", the A350 program is, in reality, nothing less than Airbus's partner governments committing launch aid to be used as a pipeline to the development of another subsidized airplane.

As the airplane subsidy disputes continue between the EU and the US, editorials in printed news media have continued to weigh in on the subject. They are uniformly critical of the launch aid subsidies that Airbus is currently getting and seeking for the future. "The US has offered a fair solution that the Europeans should accept. Subsidies already in the Airbus pipeline (including \$3.5 billion for the A380) would be grandfathered¹⁸⁶ or forgiven, but Airbus would be prohibited from getting more – including launch aid for the A350 that Airbus is now seeking. Airbus and the Europeans know that the US probably would win a [World Trade Organization] challenge, and a bruising trade war is in no one's interest."¹⁸⁷

The EU should have accepted the fair solution offered by the US and should have discontinued the Airbus pipeline of subsidies from EU governments. However,

Airbus continued seeking more aid through the financial aid pipeline provided by the EU governments.

Another critic states that "This [dispute] isn't about defense contracts, local tax breaks or supplier subsidies. It's about the launch aid: upfront money to develop planes..... Airbus gets launch aid. Boeing doesn't. If the [European Union] doesn't get that, then the US has no choice but to litigate this to the end at the WTO."¹⁸⁸ The general consensus among industry circles was clearly on the American side to take Airbus's illegal subsidy matter to the court. The American government finally filed the litigation against Airbus at the WTO. Questions still remained as to why Airbus continued getting launch aid against WTO rules in spite of the strong objections of the US government and against Mandelson's view that Airbus no longer needed subsidies.

Airbus and Boeing are media-savvy and seem to use the media to their advantage. Airbus deploys a sophisticated approach to getting a message across to Boeing and the public and seems to be responsive and proactive in their approach to the subsidy disputes with Boeing. For example, when Boeing terminated the 1992 GATT agreement and filed its complaint at the WTO in 2004, Airbus immediately responded to Boeing's complaint to the WTO and registered a similar complaint to the WTO within a matter of hours.

CONCLUSION

The 1992 EU-US agreement outlived its useful life and finally terminated in 2004. Since the termination of the 1992 EU-US bilateral agreement, Airbus and Boeing

have no longer a bilateral agreement to comply with or abide by. Over its 35-year history, massive amounts of subsidies have enabled Airbus to develop a full product line of large commercial airplanes and capture a major market share of the large commercial airplanes. Airbus's extraordinary success, however, was built upon launch aid subsidies granted by the governments of France, Germany, the UK and Spain. Without the prevailing bilateral agreement, the EU and the US have no agreement nor rules to comply with and abide by except for the WTO rules and obligations.

The US came to the realization that Airbus has been taking a full advantage of the 1992 GATT agreement for twelve years by legitimizing the EU governments' subsidies up to one third of the total R&D expenditures according to the 1992 GATT agreement. Airbus's rapid growth and achievement were extraordinary and finally overtook Boeing to become the leader of the large commercial airplane industry. The US complained that Airbus is continuously subsidized by the EU governments. In 2004, the US terminated 1992 GATT agreement and filed the complaints about Airbus' illegal use of governmental subsidies at the WTO. The EU's general consensus was that Airbus did not need continued government subsidies. The UK's Trade Commissioner Peter Mandelson supported the official view that Airbus no longer needed government subsidies, and this view was shared by a senior Airbus official in a public statement announcing that Airbus had the funds to build the A350 without any launch aid from the EU governments. Mandelson seemed to be well aware of what was going to take place. The US registered complaints at the WTO and started proceeding with the litigation against Airbus. Why didn't the US go for the negotiated settlement? That remains to be unanswered. However, it was expected that the US would take Airbus's subsidy

case to court at the WTO to end the EU-US large commercial airplane subsidy disputes through litigation.

CHAPTER 5

THE CASE OF THE EU AT THE WTO

INTRODUCTION

This chapter explains Airbus's contention on how the US Government subsidized the large commercial airplane industry (WTO case DS353). The first panel hearing in the case took place during 26-27 September 2007.

Core arguments made by the European Commission and Airbus appear consistent with Lawrence's (2001) seminal study on the US subsidies on the large commercial airplane industry.¹⁸⁹ Lawrence (2001) argues that historically, America dominated the commercial aerospace industry, particularly the large commercial airplane industry, which came into being on the back of defense technology developed and paid for by the US defense department. The frame of reference that Lawrence (2001) used for his study is the WTO rules and disciplines on subsidy, which can be found in the WTO Agreement on Subsidies and Countervailing Measures (ASCM).

THE EU's ALLEGATIONS AT THE WTO

United States – Measures Affecting Trade in Large Civil Aircraft (DS353).

A summary of the first written submission by the European Communities (Geneva, 2 April 2007):

1. In its written submission, the European Communities (EC) attempted to establish its *prima facie* case that the United States has granted \$23.7 billion in specific subsidies to the division of the Boeing Company (“Boeing”) that produces large civil aircraft. (“LCA”). The EU allegation goes on to show that these subsidies are: (1) prohibited subsidies contingent upon export performance; (2) and/or actionable subsidies that cause serious prejudice, and therefore adverse effects, to the interests of the European Communities and its LCA manufacturer – Airbus S.A.S. (“Airbus”).
2. Boeing and the US Government have collaborated closely to advance the state of US aeronautics technology, and to improve the competitive position of Boeing vis-à-vis international competition. This close relationship continues today, as valuable support pours into Boeing on an annual basis from multiple agencies of the US Government – none of which is ever repaid. The governments of states and localities also aid this partnership in a very significant way, adding to the wealth of grants, tax breaks, and other support to which Boeing has become accustomed on the Federal level. With Boeing surpassing Airbus in LCA orders by a large margin in 2006, and at the same time continuing to drive down prices, the direct results of this support have never been clearer.
3. The 23.7 billion before the Panel comprises numerous measures implemented by various federal, state, and local governmental entities. Beginning with state and local subsidies at issue, the States of

Washington, Kansas, and Illinois, and various localities therein, have provided over \$800 million in benefits for Boeing, and have committed to provide over \$4 billion in additional benefits beginning in 2007.

4. In particular, the State of Washington has committed to provide almost \$3.5 billion in tax breaks of benefit to Boeing over the next 20 years through the House Bill ("HB 2294"), as well as almost \$500 million in other incentives, including training facilities and infrastructure improvements, in connection with production of the 787. The bulk of these incentives are in the form of export-contingent tax incentives tied to the production of Boeing LCA.
5. The city of Wichita, Kansas, has provided property and sales tax abatements associated with almost \$4 billion in industrial revenue bonds issued on behalf of the Wichita facilities used to produce parts for Boeing LCA.
6. In Illinois, the state and municipalities therein have provided Boeing with a generous and long-term incentive package in connection with its decision to relocate its corporate headquarters to Chicago, Illinois, in 2001.
7. Boeing has received almost \$17 billion in funding and support from the National Aeronautics and Space Administration (NASA), and the Department of Defense (DOD), the Department of Commerce (DOC) and the Department of Labor (DOL). The bulk of this funding is provided by

NASA and DOD, primarily through their aeronautics research and development (R&D) subsidies. NASA and DOD also grant Boeing intellectual property rights to valuable research results, including patents, trade secrets, and data rights; they reimburse Boeing for certain R&D costs incurred solely pursuant to the terms of a contract; and they provide facilities, equipment, and employees for LCA-related R&D.

8. The following features are evident from an examination of the R&D subsidies:

- The US government and Boeing have had a very close and long-standing relationship that has helped Boeing to succeed in the LCA market.
- Both the US government and Boeing often admit in public statements that the LCA sector is unique in its ability to benefit from lavish government funding.
- Federal R&D funding and support greatly reduce the need for Boeing to finance its own R&D for developing new and improved LCA, and shift the risk of new product development to the US government.

- Federal R&D funding and support lead to the development of valuable technologies for Boeing's LCA division, and this technology remains with Boeing (rather than in the public domain) through intellectual property rights and other technology transfer restrictions.
9. US Government-supported aeronautics R&D will benefit all of Boeing's LCA models in the future. Even in those instances where US government R&D support is purportedly for military aircraft technology, such support often benefits LCA technology.
 10. The US LCA industry is "unique" among US manufacturing industries in having received federal government support for R&D since its inception.
 11. Specifically, NASA research has contributed to numerous advances applicable to LCA in areas as aerodynamics, flight dynamics, structures and materials, flight systems, noise reductions, and operating problems. Altogether, NASA has provided over \$10.4 billion in support to Boeing's LCA division.
 12. Among the aeronautics R&D subsidies at issue are NASA's Advanced Subsonic Technology Program and High Speed Research Program, which provided over \$2.3 billion for research that was deemed by NASA itself as vital to the future of the nation's civil aircraft industry. Much of this funding benefited Boeing's LCA division, and benefits from this funding

continue today. One of the policies of these programs was to restrict the transfer of valuable information outside of the United States because, in NASA's words, "it is critical for the US to maintain its lead over foreign competition in aerospace technology."

13. The legacy of these programs has continued in other multi-billion dollar NASA aeronautics programs that have funded LCA-related research by Boeing, such as the High Performance Computing and Communications Program and the Aviation Safety Program.
14. Boeing's ability to launch its "new generation" high-technology B787, using more than 50% composite materials was made possible through decades of funding and support provided by NASA including Advanced Composites Technology (ACT) Program. These programs were focused on increasing the use of composites in LCA. For example, NASA's stated goal for the ACT program in the 1990s was to increase the competitiveness of the US aeronautics industry by putting the commercial transport manufacturers in a position to expand the application of composites beyond the secondary structures in use today to wings and fuselages by the end of the 1990s.
15. Boeing and NASA employees have worked closely together in integrated teams to create technology for Boeing's LCA, with the personnel cost for highly skilled NASA and Boeing employees being paid by the US government.

16. Almost \$2.4 billion in support through contracts under DOD's research, development, test, and evaluation (RDT&E) Program have also directly benefited Boeing LCA, without any requirement that Boeing repay any portion of the commercial benefits to the US Government.
17. In addition, NASA and DOD have transferred valuable patent and other intellectual property rights to Boeing, without any demand for payment or license fees. Boeing is free to use the patented technologies for itself, or to license them to others for profit.
18. Over \$3.1 billion in independent research and development (IR&D) and bid and proposal (B&P) funding provided by NASA and DOD, in a highly secretive program of the US Government, has further allowed Boeing to develop its LCA at government expense.
19. The US DOC and US DOL have provided support to Boeing that particularly benefits the development of the Boeing 787.
20. In addition, the US Government has provided almost \$2.2 billion in export contingent tax relief to Boeing under the Foreign Sales Corporation (FSC) and Extraterritorial Income (ETI) Excursion regimes that impact the sales of Boeing LCA.

21. The United States has carefully designed all of these subsidies for the US LCA industry particularly to enhance Boeing's competitiveness and, in turn, to cause harm to Boeing's only remaining competitor in the LCA market, the European Communities' manufacturer of LCA, Airbus.

The EU argued that the US government provided Boeing with \$23.7 billion worth of the governmental subsidies. However, the EU had not been able to provide the evidential proof on how and when the \$23.7 billion had been granted to Boeing by the United States government. The EU also argued that Boeing received cross-subsidization, which is the technology transfer to the large commercial airplanes from the technologies developed from Boeing's defense contracts with the US Defense department. However, the cross-subsidization was hard to prove. Therefore, Airbus's allegation suffered from a lack of validity and substance because Airbus had not been able to prove to the WTO how the \$23.7 billion had been granted or loaned out to Boeing. On the other hand, Boeing had a hard evidence against Airbus, a copy of the loan agreement between Airbus and the European Governments: this clearly showed the government loans to Airbus at a below market price, which was legally considered to be the government subsidies.¹⁹⁰

THE EU'S LEGAL CLAIMS

The European Governments claimed that the US Government, the states of Washington, Kansas, and Illinois including municipalities had granted a total of \$23.7 billion in subsidies to Boeing. Therefore, the Europeans sought a WTO ruling

that the United States withdraw the subsidies in violation of its obligations under the SCM Agreement. The following table depicted the WTO processes. The table depicted the original schedule, called for the completion date of 16th of June 2008, which had already been six months behind the original schedule. In fact, the final ruling of the case reached almost three and a half years later in late 2011.

WTO DISPUTE PROCESSES FROM 2007 TO 2008

- **EU WTO Challenge to US Subsidies to Boeing (WTO case DS353)**

22 March 2007: EU filed confidential version of First Written Submission
6 July 2007: US filed confidential First Written Submission
26-27 September 2007: First panel hearing
28 September 2007: EU's non-confidential First Written Submission on its website
16-17 January 2008: 2 nd panel hearing (rebuttals submitted on 6 November 2007)
7 April 2008: issuance of the confidential interim Panel report (to the Parties)
16 June 2008: issuance of the final Panel report
Publication of the final report: (after translation – approximately 2-4 months)

Source: European Commission

THE EU WTO CHALLENGE TO US SUBSIDIES TO BOEING (WTO case DS353)¹⁹¹

In its WTO case against the US, the EU made numerous allegations on various US subsidies to Boeing as follows:

- The EU alleged that “following the United States’ unjustified and unilateral withdrawal from the 1992 bilateral EU-US Agreement on Trade in large Civil Aircraft (LCA) and the initiation of WTO dispute settlement procedures against the EU, the EU for its part on 6 October 2004 decided to mirror the US steps by initiating WTO dispute settlement procedures regarding a number of US measures, including federal and state subsidies.” A WTO panel was set up thereafter.
- The EU also advanced the argument that “the EU has undertaken numerous good faith attempts towards a negotiated solution to the differences of opinion between the EU and the US, without success to date.”

First Panel Hearing¹⁹²

The EU asserted that the core of the EU’s challenge is the “lavish R&D support” that the US Department of Defense (DOD) and NASA provided through various means, as well as Boeing-specific support provided at both state and local level, such as subsidies specifically made for Boeing in the states of Washington, Kansas, and Illinois. Clearly, the R&D support from the US DOD had the effect of weakening Airbus’s stance and competitiveness, and strengthened Boeing’s assertions. Although the US tried to dismiss Airbus’s challenges by using exaggerated claims, the US government law makers including the high ranking US officials and

politicians acknowledged their critical roles and support that have been given to Boeing.¹⁹³ However, the US argued that Airbus is also getting the cross-subsidization from EADS, but the EU dismissed such claims from Boeing insisting that there is no proof for such exaggerated US claims.

The US Reply to the EU's Challenge Filed by European Commission¹⁹⁴

The US's reply to the EU's challenge was filed on 6 July 2007. The European Commission offered the following points which were the focus of the hearing before the WTO panel hearing on 26-27 September 2007:¹⁹⁵

1. The US readily acknowledged that the Foreign Sales Corporation (FSC) and the succeeding schemes prohibited export subsidies and that Boeing was a main beneficiary. However, the US argued that Boeing no longer received any benefits post-2006 even though an internal IRS (Internal Revenue Service) memorandum allowed for such benefits to be claimed by companies like Boeing. The EU claimed that the US had failed to provide any documentation that Boeing no longer received any such benefits.
2. For subsidies that were granted by the state of Washington and the state of Illinois, the US put up a less than vigorous defense and appeared to agree with the EU that subsidies have benefited – and would continue to benefit – Boeing. The EU's argument was that in both states, the subsidies were clearly marked for the exclusive benefit of Boeing. The EU continued to argue that the US claims that these subsidies were generally

available, or not designed for the benefit of Boeing lacked credibility. Indeed, these incentive packages had been designed in negotiations with Boeing, and even included a contractual promise by the state of Washington that would provide a US\$ 4 billion subsidy regardless of form.

3. However, the EU's argument against the US was short of any convincing substantive arguments because the EU provided no evidential support for its own defense. The US's claim that these subsidies are generally available to public companies appeared to be credible and factual: for example, the US's claims regarding NASA's research results being available to public are widely known. Furthermore, the EU has in the past made use of NASA's aeronautical research results that are available in the public domain.
4. For other subsidies, such as those granted by the state of Kansas, the US claimed that Boeing had not benefited, and will not benefit in the future. The US provided no evidential back-up for these claims. The EU argued that these bonds are referred to as "Boeing Bonds" simply because they are for the benefit of Boeing.
5. The European Commission, in the face of the US's challenge to EU support in the DS316 document, provided detailed breakdown of all Large Civil Aircraft (LCA) – related research and technology (R&T) support and offered to submit all original documentation regarding such support upon

the Panel's request. The EU questioned why the US is not equally forthcoming like the EU.

6. The US argued that certain R&D support should be excluded for purposes of the WTO dispute as it resulted from military or dual-use technologies which are subject to stringent US export controls and cannot be included in LCAs for exportation. However, the EU countered that the US conveniently overlooked the fact that while such technologies may not be part of exported LCAs as such, they may be – and frequently are – used in the actual production of LCAs. Furthermore, the EU argued that the press and a former Boeing engineer have reported suspicious Boeing practices of recreating research to work around ITAR (International Traffic in Arms Regulation) controls and use military data for the B787 despite US restrictions. The EU argued that this is another example of how the US hides behind general statements about US laws and regulations whilst refusing to disclose the actual information and evidence related to R&D support to Boeing.
7. The EU argued that various US federal, state and local subsidies that supposedly benefitted Boeing amount to \$23.7 billion. These subsidies are, in fact, WTO inconsistent subsidies which are not in compliance with the WTO rules in the past two decades up to 2024 as shown in Exhibit 9 in Appendix, Overview of US subsidies to Boeing Large Civil Aircraft division.

The EU is further alleged that this number would reach \$300 billion if the EU were to use the same calculation method as used by the US in reaching the inflated subsidy numbers in its case against alleged support to Airbus.

However, equally it can be argued that whilst having government subsidies of such duration may not be particularly unusual in Europe, the fact remains that having government subsidies over many years does not encourage competition between Airbus and Boeing. The argument supports the Bush administration's doctrine that forgives all past subsidies in order to carry on with a fresh start under the subsidy-neutral condition.

8. At federal level, the EU claims that Boeing benefitted from numerous types of R&D support provided by NASA and the Department of Defense (DOD). The EU argued that this support includes contracts for R&D work to be carried out by Boeing (ultimately benefitting Boeing's LCA division and Boeing's aircraft models), reimbursement of Boeing's own R&D expenses, extensive cooperation with NASA and DOD engineers at no cost to Boeing, and the use of testing facilities and equipment, also at no cost to Boeing. This support is coupled with the transfer of patents and other vital knowledge to Boeing, and reinforced by stringent restrictions on the application and use of such knowledge by foreign competitors. The EU estimates the benefits of US federal research programs to Boeing at around \$16.6 billion over the last two decades.

9. According to the EU claims, the US predictably sought to argue that this constitutes payment for “services” which the US claimed are not covered by the WTO disciplines on subsidies. The EU firmly disputed this and it is arguably one of the areas where the EU is on relatively strong ground: despite the fact that some of NASA’s activities relate to general public interest areas such as space exploration, the fact remains that the specific NASA R&D programs challenged by the EU amount to fake transactions solely intended to provide funding and support to the US aeronautics sector/Boeing in very specific and costly areas of research. The EU argues that the resulting R&D is consistently applied to Boeing’s airplane models. These so-called “purchases of services” completely lack the basic characteristics of normal purchase of services – the US has failed to demonstrate what NASA actually “procures”. In short, the EU’s argument was that NASA had funded 100% of specific R&D (i.e. no contribution from Boeing whatsoever), but Boeing undertook the research and ultimately retained all resulting technologies and knowledge. The EU argued that this notably includes any resulting patents where the ownership is explicitly waived for the benefit of Boeing. This allows Boeing to freely apply technologies and knowledge to its LCAs at no cost.
10. The US further sought to argue that the US government was not overpaying and had followed procurement procedures, just as it argued that Boeing received “adequate consideration” in return for what it provides. The US failed to provide any support whatsoever for these

claims and simply referred to various Department of Defense Regulations.

11. At federal level, Boeing also enjoyed significant tax breaks under the Foreign Sales Corporation and successor legislation. That legislation had already been found to constitute prohibited export subsidies by multiple WTO panels and the WTO Appellate Body. The EU estimated these tax benefits at a value of \$2.2 billion to Boeing's LCA division over the period 1989-2006. The US neglected to address the EC's actual claim: a recent official IRS Memorandum allowed US exporters, including Boeing, to continue to benefit from the illegal tax breaks even after the end of 2005 which should have marked the end of all benefits under the FSC and successor legislation.
12. At the state and local level, subsidies to Boeing included a \$4 billion package in the state of Washington (combining tax breaks, tax exemptions or tax credits, and infrastructure projects for the exclusive benefit of Boeing) and a \$900 million package in the state of Kansas in the form of tax breaks and subsidized bonds, some of which are known as "Boeing Bonds". These will be enjoyed by Boeing until 2024.
13. The EU demonstrated before the WTO panel that the lavish subsidies benefitting Boeing had allowed Boeing to engage in aggressive pricing of its airplane which had caused lost sales, lost market share and price suppression to Airbus on a number of selected markets. It also

endeavored to show that Boeing received illegal export subsidies in addition to the Foreign Sales Corporation program: the Washington state package was made contingent upon Boeing's export performance. Finally, the EU also claimed that the US had caused serious prejudice to the EU's interests by violating the EU-US 1992 agreement.

14. The EU stated that it remained open to negotiating a solution. However, the starting point for such negotiations should be realistic, balanced, and pragmatic.

In reply to the US's complaints about the EU government subsidies to Airbus, the EU argued that there are several US subsidy programs that benefitted Boeing which were as follows: (1) the US state and local subsidies; (2) NASA subsidies; (3) the US Department of Defense subsidies; (4) the US Department of Commerce subsidies (National Institute of Standards & Technology); (5) the US Department of Labor; and (6) the US federal tax incentives.

The following are the EU's arguments in reply to the US's complaints:

1. The US State and Local Subsidies

The EU argued that the US state and local subsidies came from the states of Washington, Kansas, and Illinois. The Washington state's incentive package of measures benefitted the development, production and sales of US's large commercial airplanes. These Kansa incentives are not only limited to tax and other advantages, but also inclusive of

bond financing and other advantages to the US's large commercial airplane industry. Illinois' incentives included tax incentives, relocation assistance, and other advantages to the US's large commercial airplane industry.

2. NASA Subsidies

The EU argued that NASA transfers economic resources to the US large commercial airplane industry on terms more favorable than available in the marketplace by several ways and means. NASA subsidies are summarized as follows:

1. NASA allows the US large commercial airplane industry to participate in research programs, and makes payments to the US large commercial airplane industry under those programs. NASA enables the US large commercial airplane industry to exploit the results thereof by means including (but not limited to) the foregoing or waiving of valuable patent rights, the granting of Limited Exclusive Right Data ("LERD") or otherwise exclusive or early access to data, trade secrets, and other knowledge resulting from government funded research.
2. NASA provides the services of NASA employees, facilities, and equipment to support the R&D program listed above and pays salaries, personnel costs, and other institutional support, thereby providing valuable services to the US large commercial airplane industry on terms more favorable than available on the marketplace.

NASA provides Independent Research & Development, and Bid & Proposal Reimbursements.

3. NASA allows the US large commercial airplane industry to use the research, test and evaluation facilities owned by the US government, including NASA wind tunnels, in particular the Langley Research Center. NASA enters into procurement contracts with the US large commercial airplane industry for more than adequate remuneration.
4. NASA grants the US large commercial airplane industry exclusive or early access to data, trade secrets and other knowledge resulting from government funded research. NASA allows the US large commercial airplane industry to exploit the results of government funded research including the foregoing or waiving of valuable patent rights or rights in data.

3. The US Department of Defense Subsidies

The EU supported the argument that the US Department of Defense (DoD) transfers economic resources to the US large commercial airplane industry on terms more favorable than available in the marketplace as follows:

1. DoD allows the US large commercial airplane industry to participate in DoD-funded research, making payments to the US large commercial airplane industry to exploit the results of such research, by means including, but not limited to, the foregoing or waiving of valuable patent rights. Furthermore, the DoD allows the US large

commercial airplane industry to use research, test and evaluation facilities owned by the US government, including the Major Range Test Facility Bases.

2. DoD also enters into procurement contracts including those for the purchase of goods from the US large commercial airplane industry for more than adequate remuneration including: the US Air Force contract with Boeing for the purchase of certain spare parts for its Airborne Warning and Control System (AWACS) airplane and other programs.¹⁹⁶
3. DoD also allows the US large commercial airplane industry to exploit the results of government funded research including the foregoing or waiving of valuable patent rights or rights in data.

4. The US Department of Commerce subsidies (National Institute of Standards & Technology)

The US Department of Commerce transfers economic resources to the US large commercial airplane industry on terms preferable to those available on the market through the Advanced Technology Program operated the Omnibus Trade and Competitiveness Act of 1988, as amended, and the American Technology Pre-eminence Act of 1991, by allowing the US large commercial airplane industry to participate in this program, making payments to the US large commercial airplane industry under this program, including the foregoing or waiving of valuable patent

rights, and the granting of exclusive or early access to data, trade secrets and other knowledge resulting from government-funded research.

5. The US Department of Labor Subsidies

The US Department of Labor transfers economic resources to the US large commercial airplane industry on terms preferable to those available on the market through the Aerospace Industry Initiative, an element of the President's High Growth Training Initiative, under the authority of the Workforce Investment Act by granting funds to Edmonds Community College in the State of Washington for the training of aerospace workers.

6. The US Federal Tax Incentives

The US government transfers economic resources to the US large commercial airplane industry through the federal tax system, and in particular through the following tax measures: Sections 921-927 of the Internal Revenue Code (prior to repeal) and related measures establishing special tax treatment for "Foreign Sales Corporations" ("FSCs"); FSC Repeal and Extraterritorial Income Exclusion Act of 2000; and the American Jobs Creation Act of 2004.

CONCLUSION

The EU supports the argument that historically, America dominated the commercial aerospace industry particularly, the large commercial airplane industry which started

on the back of defense technology developed and paid for by the US Defense Department. The frame of reference that Prof. Lawrence used for his study is the WTO rules and disciplines on subsidy, which can be found in the WTO Agreement on Subsidies and Countervailing Measures (ASCM).

The EU claims seem to be consistent with the theoretical arguments developed by Lawrence (2001). However, Airbus's arguments needed the legal defense better than, or comparable to Boeing's legal arguments. Airbus strongly contended how the US government illegally subsidized Boeing through cross technology transfer from Boeing's defense technology to commercial airplane manufacturing capability. Airbus's arguments on cross-technology transfer have two problems. First, it is very difficult to prove how much military/defense technology was cross-transferred to commercial airplane manufacturing technology. Second, if Airbus was able to prove the cross-technology transfer from military airplane manufacturing to large commercial airplane manufacturing at Boeing, this same rule will also apply to the EADS's military technology to Airbus commercial airplane manufacturing.

The EU-US subsidy dispute was focused on the EU's WTO challenge to US subsidies of Boeing (WTO case DS353). The European Communities alleged that the states of Washington, Kansas, and Illinois, and the US government have granted \$23.7 billion in specific subsidies to Boeing. However, the biggest problem with the EU's argument is the lack of the solid evidential proof: the support given lacks validity and authenticity. The EU's claims of \$23.7 billion worth of governments subsidy that Boeing gets from the US government is mostly based on how the EU quantified each items in dollars and cents that Boeing is supposedly getting from the US governments. However, during an interview with Charlie Miller,

Director of Boeing UK in London in October 2009, Miller argued that Airbus gets so-called “soft loans” which are below market rates with lenient payback terms from the EU governments. He also confirmed that Airbus’s “soft loan” from the EU governments is on public record.

According to Professor Lawrence, “the US large commercial airplane industry sector received federal financial contributions or subsidy in the years of 1996 and 1997 of more than one billion dollars a year from NASA and DOD”¹⁹⁷. The European Communities claimed that the United States provides prohibited subsidies through various federal, state and local measures and provides actionable subsidies that have caused, and continue to cause, adverse effects to the interest of the European Communities. Consequently, the European Communities asked that the United States withdraw its subsidies. Although the EU made a strong case out of NASA’s technology transfer to Boeing, it is very difficult to quantify how much technology was transferred in terms of dollars and cents. However, Boeing’s claim regarding “soft loan” that Airbus received from the EU governments is a strong case for Boeing. At the end of the day, this gave Boeing a much stronger case than Airbus in the eyes of juries at the WTO. Boeing finally won the case in 2011.

CHAPTER 6

THE CASE OF THE US AT THE WTO

INTRODUCTION

The United States formally filed its consultation request at the WTO in July 2007 and charged that the Europeans provided Airbus with substantial subsidies¹⁹⁸. In a quick response to the US claim, the EU also filed the same charges against the US on the same day by requesting consultations at the WTO. The EU stated that they filed a consultation request as a prompt response to the US challenge¹⁹⁹.

The EU's case was against alleged US subsidies through adverse effects claims and its subsidy claims. The EU's case against Boeing is a mixed blessing to both Airbus and Boeing because, on the one hand, its case gets a lot of media/publicity attention and on the other hand its case gets a lot of scrutiny.

The EU alleged that Boeing is just as heavily subsidized, if not or more so, than Airbus. The US argues that the EU simply ignored the mass of evidence, enhanced its allegation and even requested the Panel to accept it without any evidential support²⁰⁰. The US also claims that, by lodging the WTO case, the EU expected the WTO examination of the case to end up with "assured embarrassment" to both Boeing and Airbus for violating trade rules²⁰¹. The US argued that this was a clear indication of the EU's intent to move focus away from the EU's embarrassment by creating the impression that the US provides subsidies even more than the EU and its member states do.

The US also complained that the EU's claims and allegations were inaccurate and erroneous. The US argued that the EU systematically exaggerated and misstated subsidy amounts involved in the subsidy disputes and inaccurately characterized the nature of the programs at issue. The US evaluated the programs at issue, according to the requirements of the "Subsidies and Countervailing Measures Agreement" ("SCM Agreement"). The evaluation of the program confirmed from the US perspective that the amounts of the subsidy at issue were substantially less than the amount alleged by the EU.

Two major arguments emerge from the various allegations made by the EU and the US governments. The first is built on the EU's adverse effects arguments which hinge on four theories: "knowledge effects", "price effects", "technology effects", and "subsidy effects". These four adverse effects arguments are discussed in section 7.2. "The US Rebuttal of The EU's Adverse Effects Allegations and the EU's Adverse Effects Arguments." The second major argument is the "EU's Subsidy Allegations" to be discussed in section 7.3, "The US Rebuttal of the EU's Subsidy Allegations." The EU alleged that Boeing receives "indirect" support from the US government by claiming the US government's purchase of Boeing services as "grants."

The EU and the US both started making a series of challenging allegations in their disputes. The US challenged the EU's subsidy allegations on the ground of gross exaggeration of R&D costs, misinterpretation of the US government tax systems, and a catch-all sweeping rebuttal against the US allegations.

US ARGUMENTS - THE US REBUTTAL OF THE EU's ADVERSE EFFECTS ALLEGATIONS (DS353)²⁰²

The United States made a large number of points in its first written submission to the WTO regarding the EU's allegation that certain US programs were specific subsidies that have caused adverse effects.²⁰³ However, the US counter-argued that the programs identified by the EU had not caused any adverse effects to the EU's interests. The United States argued that Airbus had made a phenomenal progress and had overtaken Boeing contrary to the EU's claim that the US government's subsidies to Boeing caused adverse effects to Airbus and EU interests. In fact, Airbus's market share jumped by 20 percentage points in just six years from 39% in 2000 to 59% in 2006. The US argued that although Airbus had some difficulties with production delays of its A380 and in the design phase of its A350, Airbus even concedes that these problems have nothing to do with the alleged subsidies.²⁰⁴

FOUR MAJOR "ADVERSE EFFECTS" ARGUMENTS (THE US COUNTER-ARGUMENTS)

The US argued that there are four major adverse effects to Airbus: these are based around "knowledge effects", "price effects", "technology effects", and "subsidy effects". The US argued that in order to successfully proceed with its actionable-subsidy claims, the EU had to show that the US programs caused adverse effects to Airbus. This is a key point in its counter arguments. The US argued that the two actionable claims, "knowledge effects" and "price effects," hinged on two theories: first, that certain US R&D programs had "knowledge effects" enabling Boeing to develop the Boeing B787 earlier than it otherwise would have; and secondly, that all

challenged programs had “price effects,” whereby Boeing received “free cash” that was used to “price down” the Boeing B787, B737, and B777.²⁰⁵

(1) “Knowledge Effects” Arguments by the US

The US argued that, contrary to Airbus’s claims, there were no “knowledge effects” on the Boeing B787. When Boeing committed its resources to the B787, Boeing and Airbus both had access to the same composite and other cutting-edge technology. Airbus frequently boasted of its leadership in the field and of the composite content in the A380. The US, therefore, argued that Airbus made a decision to go in another direction and that the EU blamed Airbus’s setbacks on alleged “knowledge effects” on the B787.

(2) “Price Effects” Arguments by the US

The EU argued that all challenged programs effectively gave Boeing the “free cash” that was used to drive down the prices of B787, B737, and B777. However, Boeing strongly argued that there were no “price effects” on the Boeing B787, B737 or B777. By its own admission, the expert’s model did not apply to companies whose access to the capital markets was not constrained, as was the case with Boeing which had relatively little debt and regularly repurchased large amounts of its stock. The EU’s theory ran headlong into the balance of evidence that suggested that Airbus, not Boeing, had driven prices down in order to increase its market share.

(3) “Technology Effects” Arguments by the US

The EU’s contention was that the subsidies which Boeing received had a great impact on the development of the Boeing B787 much sooner than it actually did.

The EU claimed that “the ‘nature’ of the subsidies gave rise to ‘technology effects’ on the B787.”²⁰⁶ However, the US argued that the EU provided no evidence, nor any ground to substantiate its claims that the alleged subsidies helped Boeing develop the B787 sooner than it did. The EU provided no evidence that in the absence of the alleged subsidies, Boeing would have developed the B787 later than it did or differently than it did.²⁰⁷ The US further argued that the NASA research at issue was a case in point and was widely available in the commercial marketplace. In fact, Airbus was a leader in composites technology at the time of its decision to launch the A380.²⁰⁸

(4) “Subsidy Effects” Arguments By the US

While Airbus has experienced some problems and difficulties with its A380 and A350, its situation continued to improve with its first A380 finally delivered in October 2007, almost two years after the original delivery date. Three basic arguments were made by the EU to support its claim that the alleged subsidies seriously prejudiced Airbus in terms of price suppression, lost sales, and market displacement or impedance.²⁰⁹

First, the EU argued that the magnitude of the alleged subsidies was so great that they must have caused serious prejudice. The US government argued in response that EU’s calculations grossly exaggerated the value of the alleged financial contributions and any benefit they could conceivably have conveyed to Boeing.

Second, the EU claimed that the nature of the alleged subsidies caused Boeing to lower its civil aircraft prices below what they otherwise would have been; gave Boeing an opportunity to further lower its large commercial airplane prices

below what they otherwise would have been; and gave Boeing a technology advantage in developing the 787 that it would not otherwise have had. The EU argued that these effects in turn caused price suppression, lost sales, and displacement or impedance. However, the US argued that the EU had misunderstood the nature of the programs it attacked. The programs did not increase non-operating cash flow. However, the US suggested that this EU's error should in itself be conclusive. The US further argued that the EU then made another error, - asserting that increases in non-operating cash flow would lead a company like Boeing to change its pricing practices. The US strongly argued that the EU's assumptions and conclusions were basically flawed. The US argued that it is the market, and not changes in cash flow, that determines Boeing's prices (although one might note that the market for civil aircraft has some rather distinctive characteristics as argued in earlier chapters). The EU's conclusion that cash flow affects Boeing prices is based on a series of propositions set out in the Cabral Report²¹⁰. The US argued that the EU's Cabral Report is fundamentally flawed because it is based on the wrong assumptions²¹¹.

Third, the EU might have calculated precisely how the alleged subsidies collectively reduced the prices charged by Boeing on particular transactions. However, these calculations were derived from Cabral's economic model, which accepted as given what the US viewed as the EU's exaggerated calculation of the magnitude of alleged subsidies and the erroneous propositions noted above. Therefore, Cabral's reliance on invalid data and an invalid methodology produced invalid results.

Finally, by undercutting Boeing's prices, Airbus had set pricing expectations in the marketplace at a level that is lower than would otherwise have

been the case. This might well be of particular concern to Americans in a market where there are only two suppliers. Such choices of business practice that Airbus made are the cause of any difficulties that Airbus might now face, and they had nothing to do with the alleged subsidies.

THE US REBUTTAL OF THE EU's SUBSIDY ALLEGATIONS²¹²

The US government counter-argued the EU's assertion that Boeing continues receiving "indirect" support by labeling the purchase of services as "grants," grossly exaggerating the dollar amounts of research and development, challenging programs that are not "specific" and misrepresenting the US government state tax systems. Boeing argued that the EU's rhetoric on its subsidy claims cannot alter the essential underlying facts.²¹³ the US government's rebuttal to the EU claim is that the EU distorted and wrongly labeled the US government's procurement, specifically the DoD's (the Department of Defense's) and NASA's procurement of research services, as "grants." The heart of the EU's case was against the US government's procurement of research services from private contractors. However, Boeing argues that the purchase of services is not subject to the Subsidies and Countervailing Measures (SCM) Agreement disciplines. In fact, services are purchased by the DoD and NASA to support government work that is entirely unrelated to large commercial airplane (LCA) development and production.

The US argued that the EC claims are exaggerated. Two-thirds of the challenged support (that amounts to \$12.8 out of \$19.1 billion that the EU claims Boeing has received through 2006) is directly related to DoD and NASA research activities. The fact of the matter is that Boeing received only a fraction of this

amount. To reach \$12.8 billion, the EU treated portions of the DoD and NASA budgets as 100% subsidies to Boeing, inclusive of all government overhead expenses and payments that were made to other companies. The EU claims were way out of proportion and grossly exaggerated.

The US argued that EU misconstrued US Government cost-based contracting. The EU portrayed the US government's reimbursement of overhead costs, such as independent research and development (IR&D) and bid and proposed costs (B&P) as a subsidy payment. The EU ignored that for cost-based contracts, where government payments are made based on the costs incurred, the recovery of overhead cost reflected commercial-pricing practices. The EU also ignored that the US government contracts with Boeing for its services in the same way the government contracts for services with all of its suppliers, across all agencies.

The US argued that the EC misrepresented US state tax systems. Washington state's Business and Occupancy Tax (B&O Tax) has different tax rates for different activities. In the case of aerospace manufacturing, a 2003 law gave a two-stage reduction in the B&O tax rates for different activities from one of the highest levels to the middle of the range. This was tax equalization – not a subsidy – and also applied to other aerospace businesses. Then what's the difference one might ask? However, what's the difference one might ask? The EU also misrepresents two widely-available bond programs in Kansas as Boeing subsidies – one which has been used for decades by many companies from a wide variety of industries.

The US also argued that the EU attributed funds to Boeing that it did not receive. The EU attributed funds paid to companies other than Boeing as if they

were payments to Boeing. But if the Boeing was an indirect beneficiary, what's the difference one might ask? The EU treats billions of NASA operations, as a financial contribution to Boeing. At the state level, the EU treated bond payments or tax adjustments to companies that are independent and unrelated to Boeing as benefits to Boeing, without any evidence – or existence – or such a pass-through.

The US rebuttal of the EU's subsidy allegations started with DoD (The US Department of Defense) research. The US government argued that the EU challenged the payments which are actually payments by DoD for the R&D services conducted by Boeing and other contractors. So the payments in question are not a US government's financial contribution for purposes of the "SCM Agreement" (the Agreement on Subsidies and Countervailing Measures).

Moreover, DoD, NASA, and other aeronautics research operations undertake business based on cost-based contracts which are commonly used practice in dealing with these types of costs. This practice derives from U.S. government procurement rules that apply to all agencies in all sectors for their acquisition practices.

(1) SUBSIDY DISPUTES ON US DEPARTMENT OF DEFENSE (DOD)

- (a) The EU's Subsidy Allegations on DoD's RDT&E (The US Department of Defense's Research, Development, Testing, and Evaluation)²¹⁴

The EU claimed that in return for the payment to Boeing for conducting research, DoD got nothing in return for its money. Boeing counter-argued that DoD did not, as the EU claims, get nothing in return for its money. Boeing argued that, in fact, on the

contrary to the EU claims, DoD did obtain valuable technology and information for military purposes. Then the EU conceded and recognized that, at a minimum, all of DoD's RDT&E projects have a military application in addition to the alleged civil application perceived by the EU. The US argued that the EU greatly exaggerated the number and value of DoD RDT&E contracts for research into technology with even a theoretical civil applicability. However, the EU claims that much of the research has "dual uses" that advanced Boeing's production of large civil aircraft. The US argued that the evidence disproves this EU assertion on the following grounds:

First, there is no question that the DoD engages in some research into "dual use" technologies from evolving civil technologies into military applications. The US argued that DoD's reference to "dual use" means the adaptation of civil technologies for military usage but not the other way around, as the EU asserts. However, the US argument here is not quite convincing. For example, the first commercial jet B707 and DC8 were the derivatives of the military aircraft. The B707 exemplifies the adaptation of military technologies for civil usage

Second, the US argued that DoD research is focused on military capabilities not relevant to civil aircraft. The US argued that the C-17 research is a case in point. The EU challenged the C-17 research but this research is nothing but the development of an airplane that has capabilities of taking off from a short, underdeveloped air field and able to air drop paratroopers and cargo from in-flight opening doors. Such capabilities are completely useless and of no practicality for large civil aircraft. It might be useful in aid operations in the Global South by governmental agencies such as the AID (Agency for International Development). By

getting rid of the doors, it would be a useful aircraft with short takeoff and landing capabilities for aid operations for developing countries with short runways.

Finally, the US argued that even if some DoD funded research developed a theoretical applicability to large civil aircraft, US export control laws make it practically impossible to apply any such technology to large civil aircraft. Strict laws and an enforcement process clearly prohibit US government contractors from receiving more than adequate payments. Therefore, there exists no basis to conclude that DoD research made a financial contribution or provided a benefit to Boeing's large civil aircraft. However, there still remain some questions on the probable technology transfer as to an applicability of useful military design work to large civil aircraft. For example, the development of the defunct commercial SST program didn't start completely from scratch because there existed the aerospace technology and the capability to build the military fighter jets that fly on a supersonic speed. However, the technology transfer from the military airplanes to commercial jets remains controversial.

*The US Department of Defense (DoD) Purchases of R&D Services*²¹⁵

This is the first problem identified and the point of counter-argument made by the United States – the EU's assertion that DoD and NASA received nothing in exchange for the funds they devoted to purchasing research and development services from Boeing. This assertion by the EU is particularly critical to the EU's argument because it is necessary both for the claim that these two agencies' contracts with Boeing are really grants, and that the magnitude of any benefit is equal to the price that the agencies paid for Boeing services. It is also critical

because the EU's claims regarding R&D services account for almost two thirds of the alleged subsidies by value.

The US disagreed with the EU's assertion that DoD and NASA received nothing in return for purchasing R&D services from Boeing. The procurement contracts and agreements challenged by the EU required the contractor to undertake specified work and to provide deliverables. Therefore, payment is contingent upon completion of those requirements - those specified work and deliverables. These contracts meet the ordinary meaning of the term "purchase," namely, acquisition by payment. Research and development is a service. Hence, these payments are purchases of services.

Deputy Director at DoD Dick Ginman testified before the Panel members. The US Defense Department's procurement section undertook DoD's acquisition of goods and services to meet military objectives. Ginman worked in the area charged with developing policies and providing guidance and oversight that effectively deliver equipment and services to the armed forces and other DoD agencies and ensuring that the government's funds were well spent.²¹⁶ Ginman's testimony was summarized as follows:²¹⁷

DoD acquires goods and services to meet military objectives. DoD is not interested in civil aviation. Nor does it structure its program to promote civil aviation. DoD's acquisition of RDT&E (Research, Development, Testing, and Evaluation) services proceeds first from an identification of military needs. One of the armed services or a DoD agency identifies an R&D objective and the need to contract out for the R&D services or a DoD agency identifies an R&D objective, and the need to contract out for the R&D services to met that objective, often because DoD scientists are occupied with other projects or do not have the requisite knowledge.

Then a notice is issued to the general public seeking proposals for how to meet that objective. Based on any proposals received, DoD conducts a competition and evaluates which proposal provides the best value, in the form of meeting DoD's objectives. It then negotiates a contract or other agreement with the winning contractor.

What does DoD get under an RDT&E contract or other agreement? Most importantly, DoD obtains the work of knowledgeable contractor employees directed toward meeting the DoD objectives. An RDT&E contract typically states a research objective and describes the steps the contractor will take to meet that need. The contractor is required to provide reports and briefings for DoD employees on the progress of the work. The contractor also grants the government the right²¹⁸ to use any patented invention that the contractor develops under the contract. This work and any resulting information or technologies thereof are of great value to DoD in advancing U.S. defense objectives. RDT&E activities performed by contractors may identify a new technology that leads to a new weapons system, may improve the performance of an existing weapons system, or may decrease the cost of acquiring or using existing weapons system.

DoD operates under a set of regulations that are designed to ensure that the U.S. government gets the best deal possible for the money it is spending. Where there is a market price, DoD pays the lowest available market price. Where a good or service is not commercially traded, DoD develops an acquisition cost that reflects the commercial cost of providing the good or service. This approach, which results in what is called "cost-type" contracts, is also a market-based approach, in that the cost are based on the contractor's market-based costs for inputs, including materials and labor, and overheads. DoD's acquisition regulations require

competitive bidding – a practice that forces contractors to provide the best value for the lowest price. The competitive process provides DoD with an insight into a contractor's costs and capabilities that can be used to better negotiate when that contractor is a sole bidder.

However, there remain some unanswered questions here. All this Ginman's testimony is true, but it doesn't exclude the possibility of "unintended" benefits for civilian purposes, or an unintentional military technology transfer for commercial benefits.

Once a contract has been signed, there is a subsequent process to ensure that the contractor meets its obligations. The contracting officer monitors compliance, supported by the Defense Contract Management Agency ("DAMA"). For a major contractor like Boeing, DAMA has a staff that specializes in the contractor's operations and who work to ensure that all of its requests for payment are in fact justified. In addition, the Defense Contract Accounting Agency ("DCAA") provides an audit function to ensure that contractors are maintaining financial systems that ensure accurate claims for payment, consistent with all of our applicable rules. These rules exist precisely because, contrary to what the EU stated in its first written statement, DoD does get value in return for its money – and wants make sure that the contractor does what it promised to do.

(2) SUBSIDY DISPUTES ON NASA CONTRACTS

The EU's Subsidy Allegations on NASA R&D²¹⁹

The EU has also argued that NASA research programs provided grants, and goods and services to Boeing for free. When NASA purchases R&D services from Boeing

to fulfil NASA's objectives, the EU called them research "grants" to Boeing. It seemed that the EU's allegation was heavily dependent on the NASA and DoD (the US Department of Defense) being the great benefactors subsidizing Boeing's airplane programs. Basically, the EU's allegation and defense came right out of Professor Lawrence's allegation that the US dominance in commercial aerospace and LCA (Large Commercial Aircraft) sector is almost entirely backed by the defense technology paid for by the US government. Professor Lawrence's allegation was that although the actual transfer of technology transfer is difficult to quantify, "a financial benefit of roughly \$560 million a year was transferred from DoD programs to the US LCA sector." The financial benefit of \$560 million a year to Boeing was nothing but a mere conjecture on the part of Professor Lawrence. There's no evidential support to back it up. It was highly unlikely that this kind of defense held water in the WTO litigation. In fact, Airbus lost in the preliminary ruling in late 2009. As it stands right now, Airbus's chance of winning the on-going litigation against Boeing seems bleak.

Perhaps Airbus misjudged or underestimated Boeing's capability of winning the corporate litigation. Typical American firms listed in the US stock exchange have their own in-house attorneys for legal advice. In case of corporate takeover, M&A (merger and acquisition), and other important legal matters, big American corporations including Boeing hire one of those well-known reputable Wall Street law firms in New York. They are the most powerful law firms in the US. They can even take up on the lawyers from the Department of Justice of the US government. The chances are that these powerful law firms are capable of winning the case against the US government. In the past, the US government took IBM,

Microsoft, and others to court for Sherman Act antitrust law suit in an attempt to break them apart.

In retrospect, it was Airbus's misjudgment to take the litigation up against Boeing at the WTO. Airbus management should have known better, because is no winning case for Airbus. If Airbus management had a foresight, they should have taken the option of negotiated settlement which could have given Airbus a better deal than losing the case at the WTO. It was rather shocking to find that Airbus management is rather naïve to think that their legal defense primarily based on Professor Lawrence's book about NASA would hold this case against Boeing's professional legal counselors. It is not known if Airbus management is fully aware of the fact that big American corporations' strategies especially in the case of pending legal litigation going on, each move is measured and heavily counseled by the legal experts very well familiar with international litigation. In the recent past Airbus's move is rather irrational not deliberate when it comes down to dealing with Boeing on various critical issues ranging from market share, airplane subsidy disputes. There seems to be no initiative of solving the subsidy dispute issues, market share issues as they are directly associated with airplane subsidy issues and resulting conflicts of interest in the unique duopoly competition environment instead of accusing each other. Another surprising thing about Airbus is that Airbus so far following Boeing's initiative and battled it out at the court and lost. Should Airbus take an initiative and talking over the rule of engagement concerning what's acceptable and what's not.

The US argued that, as with DoD's research purchases, NASA purchases of R&D services were not financial contributions within the meaning of the SCM Agreement (Agreement on Subsidies and Countervailing Measures). The

US argued that the alleged provision of goods and services were in fact value-for-value exchanges pursuant to Space Act Agreements, which required the user to compensate NASA by providing money or other things of value equivalent to the value of the goods or services. The US claimed that Boeing received nothing for free.

For both the R&D purchases and provision of goods and services, NASA focuses on basic, fundamental R&D covering a broad range of aeronautics topics. NASA does not fund the development of particular products, or promote the interests of particular companies. NASA disseminates the resulting knowledge to the broadest possible extent.

NASA's resulting knowledge is available to public that includes EADS and Airbus. NASA can provide American aerospace industry with NASA's research in aerodynamics and the benefits. Some of NASA's work will be available to the general public. In fact, Airbus has often turned NASA-based research into innovative improvements in its aircraft and also draws on the military programs of its parent company, EADS.²²⁰

The US supported the arguments that there is no ground to support the conclusion that NASA research made a financial contribution or provided a benefit to Boeing's large civil aircraft.²²¹ The US also argued that the EU greatly exaggerates the value of any NASA payments to Boeing. The US further argued that where the EU claims subsidies worth \$10.4 billion, the contracts with Boeing under those programs amounted to less than \$750 million spreading out over decades.²²²

Regarding NASA purchases of R&D services, NASA Deputy Director Bill Wilshire,²²³ Deputy Director of the Aeronautics Research Directorate at NASA

Langley Research Center, testified before the Panel members. His testimony also included the EU's argument on its treatment of financial contributions to companies that are not related to Boeing. He testified NASA operations at the first substantive meeting of the Panel with the parties on September 26, 2007. Willshire's testimony is summarized as follows:²²⁴

NASA, as a US federal agency, operates under the same basic legal framework of the US government procurement laws as the US Department of Defense when it comes to contracting for research and development services. However, NASA's mission is quite different from that of the Department of Defense. This means that NASA's needs and ways of meeting those needs are also different. For one thing, NASA is a civilian agency, and does not acquire or develop weapon systems. The other thing is that NASA's mission is to develop knowledge and to disseminate that knowledge as broadly as possible. So NASA's authorizing legislation, known as the Space Act, makes this point very clear. Therefore, NASA's objectives as a civilian agency are set as follows:²²⁵

- The expansion of human knowledge of the earth and of phenomena in the atmosphere and space;
- The improvement of the usefulness, performance, speed, safety, and efficiency of aeronautical and space vehicles; and

- Cooperation by the United States with other nations and groups of nations in work done pursuant to the Space Act²²⁶ and in the peaceful application of the results thereof.

NASA's research is aimed at advancing the general state of knowledge for the public good. NASA does not conduct or contract research on the commercial projects of any company.

The EU alleged at several points that NASA's research has an effect on the competitiveness of the United States in general, and on the air transport sector in particular. The EU also noted that one of NASA's statutory objectives is "the preservation of the United States pre-eminent position in aeronautics and space through research and technology." NASA pursues that objective in the context of NASA's other statutory mandates. Therefore, NASA's aeronautical research portfolio has always been very broad, emphasizing fundamental research potentially applicable to the widest range of applications. Many research areas have little relevance to large civil aircraft manufacturers. In short, NASA does not conduct research to develop particular large civil aircraft models.

NASA performs extensive research in air traffic management and air traffic safety. However, its research has little relevance to the production of large civil aircraft. For example, any improvements in air traffic management provide no advantage to Boeing or any other aircraft. Any improvement in any air traffic safety helps all airplanes equally be they Boeing, or Airbus. More importantly, the travelling public will be the ultimate beneficiary of safer air traffic system in the US and throughout the world.

More efficient fuel consumption is another area where NASA's work most directly contributes to airlines and the travelling public. For example, one recent NASA's project studied ways to modify airplane flight paths to decrease the fuel consumption and noise impact during landing. Again, the airlines and the travelling public will be the beneficiary because of the decreased fuel consumption and the resulting lower fuel costs to airlines and the reduced aircraft emissions benefiting living environment. And, again, more efficient flight paths may be applied to any airplane, so therefore, there is no particular advantage to Boeing. Propulsion is another area where NASA performs extensive work that is not applicable to Boeing because Boeing does not manufacture engines. However, NASA's propulsion research may benefit jet engine manufacturers including P&W, GE, Rolls Royce and others.

In line with NASA's broad objectives, NASA develops its research objectives for civil aviation and obtains a broad range of input. NASA seeks advice of the NASA Advisory Council, which consists of individuals from universities, former government employees, private research companies, aerospace companies, companies in other industries, and also from the broader public. Based on all this input, NASA develops ambitious, long-term research goals.

To implement research plans, NASA develops request for proposals for research work and activities that will be needed to accomplish these research goals and objectives. NASA then evaluates various proposals from bidders, and proceeds with combined in-house and outside research activities that will do the most to meet NASA's goals and objectives. NASA scientists conduct research and also other government agencies conduct research. And NASA awards a grant to a university, or sign a contract with a private research entity such as a private research institute

or a commercial entity. NASA generally makes contracts for outside R&D services, if not available in-house, to meet NASA objectives.

Not surprisingly, given the requirement for technological expertise, when NASA makes contracts with major companies, they include Boeing, Northrup Grumman, Lockheed, Honeywell, or Raytheon. However, the EU's claim that Boeing gets some special advantage over others is not correct. In bidding competition for NASA R&D, Boeing is subject to the same evaluation criteria and rules as other companies. However, there's a difference between rules themselves and how they are applied in practice. When NASA decides to select Boeing among other competitors, the terms and conditions of the contract are the same as those published in the competitive solicitation and the Federal Acquisition Regulations, which all other contractors are subject to.

The EU's view of NASA research being primarily directed to advancing Boeing's interests is simply untrue. The EU's claim that NASA gets nothing in return for their purchase of R&D services is also untrue. NASA was established to promote "the expansion of human knowledge of the Earth and of phenomena the atmosphere and space" and "the improvement of the usefulness, performance, speed, safety, and efficiency of aeronautical and space vehicles."²²⁷ The most important return that NASA gets for its expenditures on aeronautics research is knowledge and technology, documented in reports and other information generated by R&D activities. And NASA provides the widest practicable and appropriate dissemination of information. The results of NASA research are ultimately shared globally by providing the basis for future discoveries and advancements in the US and world-wide within a reasonable timeframe. NASA maintains the world's largest open database of aeronautics research and information. Accordingly, NASA has

created and continues to be a primary contributor to the world's library and that NASA's global aero-science knowledge base will be used as a foundation for education.

The EU had made another allegation that NASA furnished government-owned property, provided institutional support, and dedicated federal scientists, engineers, and research facilities to Boeing's development of large civil aircraft in return for nothing from Boeing. NASA personnel are responsible for achieving NASA objectives. The US's view and the American work ethics are that when NASA devotes scientists, research engineers, or facilities to work on NASA programs, they are there to achieve NASA's goals, not Boeing's. What the EU fails to see is that NASA personnel's loyalty totally lies in NASA simply because that's where their paychecks are coming from. They are not providing goods or services to Boeing. They are instead working to produce research results to achieve NASA objectives and then to disseminate the research results to the broader community.

The EU recognized that NASA sometimes provided goods and services to outside entities including Boeing, pursuant to the Space Act Agreement which requires a private signatory to give NASA value – money, goods, or services – equivalent to what NASA provides to the signatory. There is no support for the assertion that NASA got nothing in return for facilities or services that NASA made available to outside entities.

Another problem with the EU argument is its treatment of financial contributions to companies and persons other than Boeing. The main problem here is the EU's view that payments to Boeing's competitors in the military aerospace market, payments to public universities, payments to Airbus suppliers, including even salaries paid to government employees who have nothing to do with Boeing –

all get treated as subsidies to Boeing. Surprisingly, the EU proposes to treat these expenditures as financial contributions to Boeing without any credible evidence of receipt by Boeing of a government payment, good or service. It seems clear that Airbus is rather weakening its case and losing effectiveness by overstating it.

In its discussion of the Washington State Business and Occupancy Tax ("B&O Tax") rate adjustment, the EU recognized that tax rate reductions for other aerospace manufacturers apply to all entities engaged in aerospace manufacturing, not just to Boeing. Some of the entities that receive the B&O tax adjustment for aerospace manufacturing activities do not even supply to Boeing. However, the EU claimed that the full value of the tax rate adjustment over 20 years is a financial contribution to Boeing. The EU treated financial contributions to Boeing's suppliers as benefits to Boeing based on the assertion that these independent and unrelated companies somehow passed the alleged subsidies on to Boeing, which could happen indirectly if it made their processes more efficient.

When it comes to NASA, the EU included contracts with other, non-Boeing suppliers of R&D services, and grants to universities as financial contributions to Boeing. And then it took the further step of treating NASA's payments to its own employees as financial contributions to Boeing. In fact, the EU alleged subsidies worth \$10.4 billion, whereas NASA actually paid Boeing less than \$750 million. The remaining \$9.6 billion, which represents the majority of the EU claim, consisted of payments to universities, payments to contractors other than Boeing compensation for NASA employees, and other operating expenses. With regard to NASA's budget, the EU provides neither evidence nor reasoning as to why such payments not made to Boeing should be treated as subsidies to Boeing. The EU simply ignored the distinction between Boeing and the actual on-Boeing recipients, and

alleged that a benefit to Boeing exists without providing sufficient supporting evidence. In short, the EU treated a financial contribution to one entity as a benefit based on nothing more than assertions unsubstantiated by any evidence.

(3) SUBSIDY DISPUTES ON DOD & NASA CONTRACTS

*The EU's Subsidy Allegations on Intellectual Property Rights under DOD and NASA Contracts*²²⁸

With regard to patent and data rights, the US argued that one critical point was that the treatment challenge arises only when a private party enters a contract with the US government. Under US law, patent rights accrue to the inventor. Therefore, the intellectual property clauses in a government contract do not confer rights on the contractor. Instead, they confer certain right on the government to use inventions or data conceived by the contractor during performance of the contract. As such, the rights retained by contractors are not given for free, but are part of an overall commercial transaction.

(4) SUBSIDY DISPUTES ON IR&D (Independent Research and Development) and B&P (Benefit and Proposal) and ATP (Advanced Technology Program)

*EU's Subsidy Allegations on IR&D and B&P*²²⁹

The EU also made allegations with regard to the independent research and development and benefit and proposal. These two are not separate payments to

contractors. IR&D/B&P are indirect costs or “overheads”, which are normal costs of doing business incurred by a company, but not related to particular transactions. Commercial operators recover such costs by passing them onto their customers as part of the prices charged to their customers. The government reflects these costs under certain procurement contracts by spreading them over the affected business of a company, and then including the share allocated to each contract in the acquisition price. The government must cover these costs in the prices it pays, or commercial suppliers won't do business with it.

The EU's Subsidy Allegations on Advanced Technology Program (ATP)²³⁰

The EU claimed that the US Department of Commerce's grants under the Advanced Technology Program to a wide range of US industries are a WTO-inconsistent subsidy. However, the US argued that the ATP is not specific and thus is not an actionable subsidy, contrary to the EU's allegations. The US also argued that these grants are broadly available to multiple industries and have been used by them, while Boeing has received a very small proportion of the total grants provided under this program.

(5) SUBSIDY DISPUTES ON WASHINGTON STATE TAX MEASURES

The EU's Subsidy Allegations on Washington State Tax Measures²³¹

The US argued that the Washington state Business and Occupation (“B&O”) tax adjustment provided to commercial airplane manufacturers does not constitute a WTO-inconsistent subsidy. An essential element of a subsidization claim under the

SCM Agreement is a financial contribution by a Member government. The EU contends that Washington state, by applying the B&O tax adjustment to Boeing, is impermissibly foregoing revenue that would otherwise be due. Boeing argued that they simply applied the B&O tax adjustment which is legally deductible under the Washington state B&O tax adjustment. The US also argued that this EU argument ignored the relevant facts and the applicable state tax law.

The US further argued that under Washington state's B&O tax structure, a good is taxed at each stage in the chain of production, leading to higher effective tax rates for more complex business activities. In order to address these discriminatory effects, referred to as "pyramiding", Washington state applies a B&O tax adjustment to certain industries. In the case of Boeing, the effect of the adjustment is to bring Boeing's tax rate inline with the average tax rate for all business activities in Washington state. Without the adjustment, Boeing's effective tax rate is significantly higher than other business activities in the state, because of pyramiding. The B&O tax rate for Boeing after the adjustment is not a preferential rate; rather, the adjustment makes Boeing's tax rate less discriminatory.

The US asserted that Washington state is not "due" a higher rate of revenue from aerospace manufacturing than from other businesses. Since the B&O tax rate does not confer a preferential rate on Boeing, the state is not foregoing revenue that would otherwise be due. Thus, there is no financial contribution. The US argued that the EU's claim fails on this basis. However, even if the Panel were to find that there is a financial contribution, the B&O tax adjustment is not specific to an industry or enterprise because several industries in Washington state also receive a B&O tax adjustment. Therefore, the B&O tax adjustment is not actionable under the SCM Agreement.

Airbus examined Boeing's Washington state's tax returns in search for any irregularities in its tax return. Airbus examined Boeing's corporate tax adjustment and deductible amounts but found nothing to discredit Boeing. Airbus's arguments on Boeing's corporate income tax returns have a rather negative effect on Airbus' on-going subsidy arguments. The basic question is the rationale behind why Airbus brings Boeing's US tax returns into the on-going airplane subsidy disputes? Clearly Airbus was investigating Boeing's tax returns in an attempt to uncover any kind of irregularity to discredit Boeing. Airbus did not succeed in finding anything worthwhile. Boeing reputation remains intact while Airbus' action of digging into Boeing tax returns seems to be out of focus.

*EU's Subsidy Allegations on Washington State Infrastructure*²³²

The US argued that Washington state infrastructure and other measures are not WTO-inconsistent subsidies. The EU contended that Washington state's expansion of two public roads, I-5 and SR 527, as part of a state-wide infrastructure improvement plan constituted a subsidy. The EU claimed this as a subsidy despite the fact that the SCM Agreement explicitly excludes general infrastructure from its subsidy disciplines. The expansion projects that the EU challenged are in fact quintessential general infrastructure, as they are open to public and their use is in no way limited to anyone – let alone Boeing. A state commission that examined Washington State's transportation requirements identified the two public roads, I-5 and SR 527 as priorities because of congestion and accident rates. I-5 is a public road and a part of the U.S. Interstate Highway System. It is used by the countless businesses, tourists, and citizens, and runs from Canada to Mexico. SR 527 is considered to be a principal arterial highway" with mostly residential and

commercial” developments. Therefore, there is no factual or legal basis for the EU’s claims that these projects to expand two major public roads are subsidies.

(6) SUBSIDY DISPUTES ON WICHITA & KANSAS BONDS

EU’s Subsidy Allegations on City of Wichita Industrial Revenue Bonds (IRBs)²³³

The US also argued that the EU’s challenges to bonds issued by the State of Kansas are completely filled with legal and factual inaccuracies. First, the IRBs issued by the State of Kansas neither provided a financial contribution to Boeing nor were they specific to Boeing. The EU alleged that an IRB program of Kansas State is merely a scheme to give Boeing certain tax breaks. However, in making this allegation, the EU ignored the mass of countervailing evidence. In fact, the tax exemptions are no longer relevant to Boeing because Kansas State has stopped assessing property tax and sales tax on commercial and industrial machinery and equipment. The vast majority of property that Boeing has financed with IRBs is machinery and equipment, which would be tax exempt regardless of the IRB program. Therefore, the US argued that Kansas State had not foregone revenue that would be otherwise due.

Further, the US argued that the IRBs are not specific to Boeing because they are broadly available to “any person, firm or corporation.” They are also not *de facto* specific. The US also claims that the percentage of IRBs issued to Boeing is not disproportionate, nor is Boeing a “predominant” user.

EU’s Subsidy Allegations on Kansas Development Finance Authority (KDFA) bonds²³⁴

Not a single bond under this program has even been issued to Boeing. Instead, these bonds were issued to an independent entity, unrelated to Boeing. The US claimed that the EU repeatedly attempts to argue that financial contributions to entities other than Boeing pass through to Boeing. However, the US claimed that there is no basis for these arguments.

(7) SUBSIDY DISPUTES ON ILLINOIS PROGRAMS²³⁵

With respect to the EU challenges to measures by the state of Illinois, the US argued that the EU fails to establish that these measures are specific. The state of Illinois has established criteria to encourage businesses to locate their corporate headquarters in the state. The US argued that these criteria are not specific to an industry or enterprise; thus, they do not constitute an actionable subsidy under the SCM Agreement.

(8) SUBSIDY DISPUTES ON EXPORT CONTINGENCY²³⁶

Export contingency is the third point on the EU's subsidy allegations. In challenging the EU's subsidy allegations, the US argued that there is no evidence to support the EU assertion that the Washington state tax measures under HB 294 were export-contingent subsidies. The EU noted that the tax measures were not to become effective until the state and "a manufacturer of commercial airplanes sign a memorandum of agreement regarding an affirmative final decision to site a significant commercial airplane final assembly facility in Washington state." A "significant commercial airplane final assembly facility" (the Washington state tax measures under HB 2294, 17 (1)(a)) is defined as a 'location with the *capacity to*

produce at least thirty-six super-efficient airplanes a year" (HB 2294, 17 (2)(d)). The US claimed that the Boeing 787 production facility satisfies this definition.

CONCLUSION

The strongest of the US legal defense came from the best legal defense undertaken by the lawyers from one of the best law firms in the US. Boeing's in-house legal counselors included a potential candidate for the US Supreme Court. Boeing's legal counselors including a former US federal judge made a difference when it came down to the international disputes at the world court of justice. Perhaps the caliber of the US legal defense counselors outranked Airbus legal team. There's no surprise in Boeing's case winning the international disputes in the world court at the WTO. It's not about whether Boeing was right or Airbus was wrong. It's about who did well and who won the case at the WTO. Like any other legal battle, the EU's subsidy allegation was generally considered gross exaggeration of the R&D cost, misunderstanding of the US tax systems, and alteration of facts and catch-all rebuttals. However, the weakest of the US side's arguments was that the US was not able to prove at the WTO court that Boeing production process is equal to or better than that of Airbus's "new generation" technology in terms of the "cost efficiency" of the modern airplane manufacturing process.

CONCLUSIONS

EU-US AIRPLANE SUBSIDY DISPUTES

This study started with several research questions: why have the Airbus and Boeing disputes been one of the longest political issues between the EU and the US? And why was the 1992 GATT agreement kept rather quiet for twelve years? But since the 1992 GATT agreement collapsed in 2004, to update this thesis, a third question was added: what has the intensity of the duopoly competition brought about? An analysis highlighted the on-going duopoly competition between Boeing, an American private enterprise, and Airbus, a successful state-sponsored European consortium company. Airbus made an astonishingly quick ascension to the leadership position in the large commercial airplane industry in 2003. Ever since, Airbus has been in a commanding post, a leader of a multi-billion dollar large commercial airplane industry. It seemed that Airbus has proven its technological excellence which is equal to or better than Boeing. And Airbus's phenomenal success seemed to have made a great contribution to the EU's exports, and hence, significant contribution to the EU's balance of payments.

However, the US filed a complaint to the WTO in 2004 over alleged European subsidies to Airbus to the amount of \$205 billion during the last thirty years. The WTO provided a mechanism for arbitration, and, potentially, resolution of disputes over alleged European subsidies to Airbus. The US denied Airbus's claim that Boeing had an unfair advantage over US government contracts, pointing out that Airbus's market share increased by 20 percent at Boeing's expense from the

year 2000. The US government's Trade Representative's office announced that the EU's claims were to distract attention from its own massive subsidies.

The EU allegation was made in the first hearing of their case against the US before the World Trade Organization on the 26th September 2007. Airbus complained to the WTO that it had lost \$27 billion in revenues over the previous three years, primarily due to the US government's illegal subsidies to Boeing.²³⁷ The EU argued that these subsidies had allowed Boeing to use an aggressive price war against them on a number of select markets. The EU also complained that Boeing received subsidies in the form of tax breaks, development of funding and outright grants, which were illegal and clearly aimed at weakening Airbus's position and competitiveness.

POLITICAL-ECONOMIC VARIABLES

Almost all academic research derives from an analysis and evaluation of the variables that have been considered relevant and critical to the outcome of the research. In order to better understand and assess the EU-US political-economic disputes in the case of Airbus vs. Boeing, this study identified key political-economic variables which may have helped the decision makers to resolve the EU-US disputes. First, the most essential variable is the political-economic environment where the EU and US dispute. It was argued that the EU-US political-economic and business environment has in recent years increasingly necessitated governmental subsidization, a process which eventually became one of the most critical issues of the EU-US disputes in the Airbus vs. Boeing case. The second variable considered

was the politicization of government subsidies as the locus of the EU–US disputes. The US government still seems to have a political-economic edge over the EU governments, and salvaged the potential loss of Boeing against unfair competition from Airbus. The third variable considered was the government-business relationship between Europe and the US. The free trade and free competition, which have been given, as it has been taken for granted, were considered to be one of the most critical variables, promoting entrepreneurial freedom and success in capitalism. Finally, the political-economic power of the US government played an important role in preventing governmental subsidies and promoting free competition and free trade. The political-economic power, as it seems, of the US government carried a political leverage to win the government subsidy case.

FINDINGS

The financial support to private businesses by governments became the most contentious issue of the duopoly between Airbus and Boeing, eventually leading to legal disputes at WTO Dispute Settlement Body. The preliminary ruling by the WTO in September 2009 sided with Boeing, concluding that EU countries have funded billions of dollars in illegal subsidies to Airbus.²³⁸ The WTO's interim ruling also cited that preferential government loans for the Airbus super jumbo A380 passenger jet constituted an illegal export subsidy. Consequently, the WTO's interim ruling potentially provided the US government and Boeing with a legal advantage to contest future government funding for Airbus. Although it is expected the EU will challenge the ruling, the WTO's ruling has greatly impacted the \$3.2 trillion global

marketplace in large commercial airplanes, in which Airbus has surpassed Boeing since 2003 to date and highlights the WTO's increasingly important role in this dispute reflected the centrality of the WTO in the global trade politics of EU-US government subsidy politics.

At stake was not only the political-economic relationship that the EU and US governments have nurtured over decades, but also billions of dollars controlled by only two producers: Airbus and Boeing. The depth, strains, and length of the political-economic disputes on government subsidy issues only exacerbated the political relations between the EU and US. It is believed that eventual settlement of the subsidy disputes at the WTO ruling saved the good EU-US political-economic relations by preventing any negative impact from prolonged disputes.

In 2011, the WTO finally ruled against Airbus's allegation of the US government aid to Boeing. The Panel and Appellate Body at the WTO upheld the US's claim against the EU's launch aid to Airbus by stating that every single grant of launch aid to Airbus over the past four decades conferred a subsidy that caused adverse effects on the United States. The Panel Body at the WTO concluded that, first, the launch aid was fundamental to Airbus's ability to launch and bring to market each of its models of large commercial airplanes; second, either directly or indirectly, launch aid was a necessary precondition for Airbus's launch of the A380 in 2000 and, therefore, it would not have been possible for Airbus to launch the A380 by financing it entirely at a commercial market rate.

The Appellate Body disagreed with the EU's argument that, without any launch aid, Airbus could have launched an A320 series of airplanes in 1987, as well as an A330 series of the large commercial airplanes in 1991. Therefore, the EU finally conceded that without subsidies Airbus would not have been able to launch

the series of Airbus large commercial airplanes including the A300, A310 and A340 airplane programs in the 2001- 2006 period. The EU's concession has strongly impacted the decision of the Panel and Appellate Body.

The WTO's interim ruling was the first step in a process that suggested a final ruling could be reached in 2011, or possibly several years later if Airbus kept appealing against the WTO's ruling. EADS, a parent company of Airbus, could be forced to repay billions of dollars in past government aid to Airbus. The WTO does not have the power to impose sanctions itself, but it can allow a nation that has been harmed – in this case the United States – to raise tariffs or impose other barriers to imports inclusive of large commercial airplanes from an offending country or countries: – in this case European countries.

Having the US agree with an out-of-court settlement seemed to be an option, or even a necessity, for Europe to prevent further escalation of the dispute in the Disputes Settlement Body (DSB) at the WTO. However, it was not known whether the EU member state governments saw it that way. During interviews undertaken in Geneva between the 13th – 15th October 2009, officials from the European Commission and the WTO declined to discuss the issues relating to the subsidy disputes between the EU and the US for the reason that the disputes were still going on at the WTO in Geneva as of October 2009.

Boeing and Airbus, however, offered a vastly different account of the governmental aid and its impact on the market. The US, on behalf of Boeing, argued that the launch aid provided for all of Airbus's previous airplane programs were illegal subsidies. So far, the prompt and concerted action taken by the US and EU governments seems to have circumvented the imminent global economic slowdown. However, a bleak economy impacted the Airbus vs. Boeing dispute to

the advantage of Boeing. This was mainly because the US administration, under the Democrats, was ready to save big US corporations, especially in the aftermath of the collapse of auto-makers, including General Motors and Chrysler, which, in all likelihood, could not have been saved. Airbus, on the other hand, has been well protected from economic recession: this is because if anything went wrong with Airbus, the European governments were likely to pay for it. Therefore, Airbus will remain infallible and perpetuate as a European consortium company regardless of whether their large commercial airplane business loses money or not. In that sense, Boeing is almost like competing against the infallible European treasury. Continued governmental subsidy to Airbus can be justified by the potential welfare cost of the unemployed Airbus workers. In so far as French government is concerned, Airbus is the most successful business undertaking in the recent years. Therefore, Boeing argues that as long as the European governments continue financing Airbus in the below market terms, Airbus and Boeing are not competing in a level playing field.

The US government can no longer crusade the laissez-faire principle of the late 1960s when Boeing almost went bankrupt with absolutely no aid whatsoever from the US government. However, a great deal of government policy changes took place in the US administration's policy since President Barack Obama. Ex-president Bush adhered to a traditional no-bail-out US policy which means that the US government does not save any failing nor failed private enterprise with the aid of tax payers' money. However, the Obama administration reserved millions of dollars in government funds ready to disburse to rescue some failing American enterprises in order to sustain US economic growth and political stability so as to make a positive contribution to protect the welfare of the American people.

Today, the US government takes a more proactive role in stabilizing US businesses and the economy, helping minimize the negative impact of seasonal economic fluctuations. The US stimulates economic growth through the monetary policy. The US monetary policy includes the effective use of interest rates by the government or central bank as well as to control the money supply to effect steady economic growth²³⁹. The US also provides the governmental aid to promote the US export that contributes to the US balance of payment. Boeing and Airbus, however, offered vastly different interpretations of the use of governmental aid and its impact on the market. The US argued that the governmental launch aid provided to all of Airbus's previous airplane programs is an illegal subsidy.

The implication of the preliminary ruling by the WTO in late 2009 was that Airbus no longer has easy access to subsidies from European governments. The panel at the WTO cited that Airbus's subsidy to its A380s is illegal. The preliminary ruling clearly reins in Airbus's freedom to use government subsidies to develop new airplane models at any cost and any time. However, what Airbus has received from the EU governments already has got the company into a position where it can be commercially viable. Whether Airbus could have done without its governmental aid is now a mere speculation. Having realized that the A380 is not the right airplane for the more fuel- and cost-conscious airlines, Airbus has now quickly started developing its "new generation" A350 to catch up with the "new generation" high technology Boeing B787. Suppose Airbus didn't have easy access to R&D funding, would it have been a more prudent and competitive rival to Boeing? If Airbus had limited funding without generous backing of the EU governments, could it have avoided the fiasco of the super jumbo A380 program?

Airbus and Boeing are building what their economy needs: the right commercial airplanes that best meet the needs of travelers and make a great contribution to their governments' balance of payments. Both Airbus and Boeing proved that they continue building state-of-the-art technology airplanes at a time when their status in the world is under challenge. Airbus and Boeing both made a huge investment in their "new generation" high technology industry contributing to their country's balance of payment. Having lost much of its automobile industry in recent years, the US needs the continued success of Boeing, a global player and major contributor to the large commercial airplane industry as well as to the US defense industry.

Boeing is the embodiment of American invention and the result of a deeply American concept developed in the principle of neo-liberalism; Airbus is the result of the European challenge to the US large commercial airplane industry. Airbus replicates the inherited tradition of state-owned consortium company reflecting the superiority of the French aerospace technology. How did these two different political actors from the US and EU play out in the government subsidy disputes at the WTO? Several conclusions were drawn from this study at the conclusion of the EU-US litigation in 2011; these are detailed in the following paragraphs:

First, the EU has stated its goal of creating mutually "assured embarrassment" through its case against the US.²⁴⁰ Obviously, the EU wanted the WTO to believe that the US had comparable programs to the EU's programs that provide Airbus with billions of Euros in grants for late-stage R&D, and local economic incentives in the form of A380 production facilities and other company-specific infrastructure. However, the US strongly argued that no such program

existed in the US to provide Boeing with \$15 billion in market-distorting launch aid. The US also claimed that there was no analogue in the US to risk-free, no- or low-interest loans that shifted the risk of commercial airplane development from Airbus to the European governments.

Second, the US looked for key legal and factual flaws in the reasoning behind the EU's assertions regarding the adverse effects and programs that Airbus has challenged. At this stage of the EU and US disputes at the WTO, Boeing's argument has already won the preliminary ruling of the case.

Third, the Airbus A350 currently being developed in direct competition with Boeing 787 airplane (also currently being built) prompted Boeing to file a complaint against European subsidies to Airbus at the WTO in late 2004. Thus, Boeing tried to prevent any more launch aid from EU governments to Airbus. However, Boeing was in a politically precarious position. Boeing was selling more airplanes in Europe than Airbus was selling in the US market. And British Airways has been, and still is, one of the biggest customers for Boeing airplanes.

Fourth, there is the growing realization that the most successful Boeing "new generation" 787 airplane program has given Boeing some control over the future prospect of the American large commercial airplane industry. The government subsidies can be looked at in terms of their efficiency in the economy as a whole to bring about its redistribution efficiency rather than productive efficiency. When Airbus decided to build the A380 to displace the 747, a huge amount of EU government subsidies worth billions of dollars went into the R&D to develop the state-of-the-art technology for the "new generation" super jumbo A380. However, the production of the A380 subsequently caused almost two-year delays,

only to find that Airbus had an impaired ability to market the A380 to compete with the Boeing B787 in the marketplace.

Airbus launched the new generation, high technology triple-deck, super jumbo jet A380 in 2000, relying exclusively on EU government financing. However, Boeing's concept of the high technology medium-range B787 clearly excelled over the Airbus A380. The studies indicate that airline customers prefer the Boeing B787, because it provides preferred passenger cabin comforts and flies directly non-stop from origin to destination over the long-range route.²⁴¹

Airbus's triple-deck A380 problem may be characterized as the "subsidy syndrome" that left much to be desired. In spite of unlimited funding by government subsidies that have been expended in the development of the A380, Airbus has been unable to prevent two-year delays of the A380 production. The Boeing B787 also encountered a series of technical problems like the Airbus A380 and suffered from almost two-year delivery delays. Both Airbus and Boeing encountered not only the technical problems of the "new generation" airplane but also the production-related problems endemic to large commercial airplane production, arising from a large number of subcontractors and their task of coordinating with second- and third-tiered suppliers' network. However, the major difference between the A380 and the B787 is that the Boeing 787 program made record-breaking sales, winning four times as many orders as the A380. The B787 has already monopolized this market sector. However, Airbus's pursuit of catching up with the most successful B787 continues. Airbus's next "new generation" A350 program is currently being developed in direct competition with the B787 in the near future. So far the most successful "new generation" new technology B787 is scheduled for the flight test before the end of 2012.

In conducting this research, we took an empirical approach to develop a complete empirical study first and then worked on the theoretical implications to complete a theory-based thesis. The theoretical foundation of the thesis consisted of the theory of state-business relationship developed by Susan Strange and the theory of varieties of capitalism regarded by Hall & Soskice (authors of *Varieties of Capitalism*) and Colin Crouch from the University of Warwick Business School.²⁴²

We have examined the Airbus vs. Boeing case at the WTO court that started in 2004 and ended in late 2011. This case study has dealt with one of the biggest political-economic disputes case studies in the recent history. The following conclusions we have drawn from this case study will be open for further discussions.

THEORETICAL IMPLICATIONS

At the outset of this study, we have identified the two theories that might best fit to explain the empirical study we have so far developed this thesis without any theoretical implications. The first theory is the state-firm relationship theory developed by Susan Strange (1992) followed by the varieties of capitalism theory regarded by Peter Hall and David Soskice. We attempt to explain this case study by these two theories developed by well-known scholars. We were a bit dismayed to hear the criticism that varieties of capitalism was not even a theory but then we came across the article, titled "Regional and Sectoral Varieties of Capitalism" written by distinguished Professor Colin Crouch (2009) from Warwick Business School²⁴³ clearly exemplifying the case study with the theoretical implication of the varieties of

capitalism. The Airbus-Boeing case study was developed within the wide theoretical perspectives of the two theories: the state-business relationships and varieties of capitalism to explain EU-US airplane subsidy disputes as follows:

The theory of State-firm relationships

There are two players to be considered in state-firm relationships. They are the state and business (or firm).²⁴⁴ The state-firm relationships have been developed by Susan Strange (1992). Her theory states that governments need to face up to the world politics as well as the structural changes associated with the politics. Accordingly, we first focused on the increasing importance of the changing environment where Airbus and Boeing operate business. Strange argues that these structural changes have permeated beyond financing and production that impact global politics and economy. Given the global politics and the changing business environment where Airbus and Boeing operate, Stange's theory seems to best fit the ongoing Airbus-Boeing competition and the business environment where Airbus and Boeing operate. Her theory is about multi-phases of bargaining theory that can be applicable to the relationship between the EU governments and the US governments, the government – firm relations that affect the EU government – Airbus relationship and the US government – Boeing relational bargaining, and Boeing to Airbus relationships which equates to a firm-firm relationships. Strange argues that because the international competition (like Airbus and Boeing) forces the states to bargain with foreign firms where the US governments and the EU governments negotiate on behalf of Boeing and Airbus. That's what exactly the EU government and the US government did to resolve the governmental subsidy dispute cases at the WTO court. Susan Strange's theory seems to be the best fit to

explain the empirical study that has been developed. The application of her relational multi-facet theory supports to explain the Airbus vs. Boeing disputes. There are some differences across the three major EU member states of Airbus. However, a “varieties of capitalism” approach can be the basis for a productive interchange among scholars. The Airbus-Boeing study was developed within wider theoretical perspectives of the state-business relationships which provided a theoretical base for explaining the EU-US airplane subsidy disputes.

The Theory of Varieties of Capitalism²⁴⁵

The variety of capitalism theory is regarded by Prof. Colin Crouch from the business school at Warwick University.²⁴⁶ The theory of the varieties of capitalism derived from the study of comparative capitalism in the preceding thirty years. The theory of the varieties of capitalism is an actor-centered concept in a firm-centered political-economic environment where strategic interactions are crucial to the behavior of economic actors. According to Hall and Soskice (2001), the relevant actors may include individuals, firms, producer groups, or government. The crucial actors seek to advance his interests in a rational way in strategic interaction with others in a capitalist economy.²⁴⁷

From the perspective of the theory of varieties of capitalism (Hall and Soskice, 2001), the large commercial airplane industry would be seen as mature industrial sectors characterized by continuous research and innovation, therefore, the US, Germany, and France are considered well-equipped to succeed. In fact, the large commercial airplane industry is in a duopoly competition between the US and EU. The empirical applications in varieties of capitalism theory highlights how policy

makers benefit when they connect two levels of analyses at a macro and micro level across the many different sectors by defining contemporary capitalism.²⁴⁸

CONCLUDING STATEMENTS

Duopoly competition between Airbus and Boeing results from both companies' almost exclusive domination of the large commercial airplane market since the early 1990s⁶ resulted from mergers and consolidation within the global aerospace industry over decades. Both the EU and US had a long history of government subsidy disputes over an alleged violation of the WTO rules by Airbus since mid-1970. Boeing and the US government seriously questioned the EU governments' financial support to Airbus after 2003 when Airbus delivered more new airplanes than Boeing.

The latest round of subsidy disputes between Airbus and Boeing were litigated by the US at the WTO. This is because the US finally decided to seek legal settlements at the WTO rather than negotiated settlements between Airbus and Boeing. However, Boeing's decision to take a legal action against Airbus was a big surprise to Airbus. This is because Airbus might have thought that Boeing will never take legal action against Airbus for fear that Boeing would lose many European airline customers if Boeing brought a law suit against Airbus. Perhaps that was the main reason why Boeing had not taken legal action against Airbus for so many years. Instead Boeing kept complaining about Airbus's subsidization while Boeing was losing market share to Airbus. However, Boeing finally filed a law suit against

Airbus's continuous use of subsidies at the WTO Dispute Settlement Body in 2005. Airbus immediately followed suit by filing complaints at the WTO.

Not many American private enterprises have corporate resources to take on a European consortium company like Airbus to justice at the WTO. Following Boeing's legal action at the WTO, Airbus immediately followed suit by filing complaints against Boeing at the WTO Dispute Settlement Body (DSB) in Geneva in 2005. The legal proceedings at the WTO lasted for six years and Boeing finally won the case at the WTO in 2011. It was generally expected that Boeing had the case because the EU governments' subsidy provided to Airbus was the known facts. The final rulings were made by the DSB as follows:

The EU and member state subsidies breached their WTO obligations. Each grant of launch aid and other subsidies provided by EU countries to Airbus over the last four decades caused adverse effects to the interest of the United States. The report found loss of market share in such non-minor markets as the EU, Australia, China, and Korea. Therefore, even without prohibited subsidies findings, the EU and its member states must still bring themselves into compliance with the DSB recommendations and rulings once adopted. Specifically, the EU and its member States will have to take appropriate steps to withdraw the subsidies or remove the adverse effects within six months.

However, it should be noted that WTO ruled in August 2010 and in June 2011 that Airbus had received improper government subsidies through loans with below market rate from several European countries. In a separate ruling in February 2011, however, WTO found that Boeing had received local and federal aid in violation of the WTO rules. Airbus vs. Boeing disputes never ceased.

GENERAL CONCLUSIONS

Subsidy disputes between the EU and the US, as it seems, are no longer the critical issue to the US as Boeing's business is booming and their main business is to reduce billions of dollars of production backlogs. Competition is intense. The subsidy disputes between Airbus and Boeing basically ended about a year ago in June 2011.

However, it should be noted that the WTO made multiple separate rulings as follows: The WTO ruled in August 2010 and in June 2011 that Airbus had received improper government subsidies through loans with below market rates from several European countries. In a separate ruling in February 2011, WTO found that Boeing received local and federal aid in violation of the WTO rules.

This should end the US claim against the EU government's subsidy to Airbus. It is not known if Boeing seeks compensation from Airbus. After all, Europe is a huge, lucrative market to Boeing, it is critically important for Boeing to keep a great reputation to European airline customer. Airbus has known this and perhaps that may be the main reason why Airbus didn't even bother with Boeing's claim against Airbus's continuous subsidies. The court decision ended the subsidy disputes between Airbus and Boeing for now. Airbus may or may not completely cease the government subsidies from now. Airbus needs to develop "new generation airplanes" after the A350. The airlines need the old model airplanes to be replaced by the "new generation" airplanes to bring down the operating costs of the airplane fleet. Airbus will need the new cash infusion to develop "new generation" airplanes, because that was the way Airbus has been doing the

business for decades. Therefore, it is most likely that Airbus and Boeing may see each other at the court some day in the future.

Why did the EU-US disputes happen when they did, particularly in terms of high level EU-US relations? Was this particular political-economic dispute worthy of causing seriously negative impact on the long-term relationship between the EU and US, notwithstanding that relationship was less important to the US than it was in the past as the US shifted attention to China and the Pacific basin countries?

From the US viewpoint, at its core, the governing issue was Airbus's sustained use of government subsidies which eventually became a presidential issue for both the Bill Clinton and George Bush administrations. However, no legal action was taken against Airbus's use of subsidies by the US government until 2004. The main reason was that Boeing had been quite hesitant to take a legal action against Airbus because Boeing was quite concerned about jeopardizing the customer relations with European airlines by taking a legal action against Airbus.

Our view is that the EU-US relationship is much stronger than ever before as the US critically needs the European allies as China's political-economic status is steadily increasing on a global basis. And also our view is that China's global presence and its omnipresent political-economic activities are positive as China increasingly involves with the rest of the world.

RESEARCH QUESTIONS AND ANSWERS

At the outset of this research, three research questions have been developed. These questions turned out to be the right guideline to help us to determine a focal

point of the thesis and setting a right course of research direction. At least these questions gave us an insight into what to look for and what needed to be answered in the back of our head from the beginning to the end of the research.

RESEARCH QUESTIONS #1

Why have the large commercial airplane subsidy disputes been one of the longest running political-economic issues between the EU and the US?

There are three primary reasons why the EU and the US have been carrying on these subsidy disputes for decades. These three reasons are directly related to the political-economic interests of Airbus and Boeing, and are supported by a small number of strategically supportive agents, namely the European governments and the US government. The three main reasons for continuing the subsidy disputes are as follows:

First, the US continued its efforts toward keeping the subsidy disputes from starting a trade war with the government of Boeing's important European airline customers. Boeing preferred not to press charges against Airbus on the subsidy issues because Europe is a huge customer base for Boeing airplanes. Instead, Boeing continued to complain about Airbus's sustained use of government subsidies, i.e. the soft loans that finance new Airbus airplane programs. The best defense for Boeing seemed to be to keep arguing about Airbus's sustained use of the EU governments' subsidies and to press the EU in moderation on the Airbus subsidy issues. Neither Americans nor the Europeans wanted the trade war that could bring about a great deal of negative impact on the EU-US trade relations. Furthermore, Boeing makes a significant contribution to the US balance of trade,

and would be particularly concerned about the unfavorable impact that Boeing's law suit against Airbus might have on airplane sales to the Airbus consortium member countries – France, Germany, UK, and Spain.

The Clinton administration was quite anxious to press charges over the government subsidies against Airbus in early 1990s, but Boeing was not about to bring a lawsuit against Airbus and the European governments that have been subsidizing Airbus. Boeing did not file complaints at the WTO during the Clinton administration because Boeing still had a major market share. Boeing decided to not overly pressure the EU governments because the large commercial airplane business in the European marketplace was critically important to Boeing since Boeing was successfully selling the “new generation” technology B787 airplanes to the European marketplace. Likewise, Airbus had complete freedom to market and sell the Airbus A380 to the lucrative US marketplace, but so far none of the US airlines has bought the A380.

Therefore, it made sense that Boeing was careful to not press charges against the EU on the government subsidies that Airbus had received: added pressures from the US government subsidy issues could possibly have triggered a trade war situation, pitting Boeing against Airbus in an undesirable political situation. Obviously, Boeing was concerned about this negative effect which would be counterproductive to Boeing's sales in the European marketplace. Both Bill Clinton and George Bush took up the EU-US subsidy disputes as one of the presidential issues; both US presidents called for a level playing field and tried to communicate this message to EU governments in an attempt to mitigate the negative effect of the European government subsidies that directly impact upon Boeing's commercial airplane business. However, the US government was not able to pressure

European governments hard enough to get the near-term result. European national airlines and European flag carriers are major customers of Boeing commercial airplanes. Therefore, the government subsidies disputes became drawn out political issues between the EU and the US.

Second, the 1992 GATT agreement turned out to be at the core of the political-economic conflicts between the European and the United States governments, which were concerned about the political and economic effects of protecting the interests of Airbus and Boeing as two principal political corporate actors. Boeing's failure to follow the 1992 GATT agreement would have definitely jeopardized its political position. Therefore, Boeing kept the pact for twelve years while Airbus took full advantage of this agreement by institutionalizing and legitimizing its on-going subsidies from the European governments. Airbus steadily increased its market share gain, while the 1992 GATT legitimized Airbus's sustained use of launch aid to its fullest extent, one-third of the total R&D expenditures.

Third, political sensitivity is one of the main causes of the long drawn-out subsidies disputes between Airbus and Boeing. Both Airbus and Boeing approached the subsidy disputes with a great deal of political sensitivity to the host governments of customer airlines: for example, Airbus kept a political balance by not making a big case out of the Japanese government's indirect subsidies to Boeing's airplane programs in a risk-sharing partnership with the three Japanese 'heavies', although Airbus was quite aware of the Japanese government's subsidies to Japanese companies involved the Boeing programs of the B787, and other airplane programs including the B777s, the B767s, and the B7J7. It has been reported that the Japanese government took a substantial loss when the Boeing-

Japan risk-sharing B7J7 airplane program was eventually terminated mainly due to the technological difficulties of building this particular airplane model.

However, the primary reason why Airbus did not press the issue of the Japanese government's "indirect" subsidies to the Boeing airplane program is because, for decades, Airbus had been trying to get a foothold in the Japanese marketplace where Boeing still maintains a dominant market share. For that reason alone, Airbus understated the Japanese government's subsidies and tried to not press the issue of the Japanese subsidies involved in the Boeing-Japan risk sharing joint ventures. For now, Japan remains Boeing's long-time major customer of commercial airplanes and a joint-venture partner of Boeing airplane programs. Airbus seems to be keeping a low profile in the political playing field, simply because pressing the issue of the Japanese government's subsidies could possibly have a long-term negative effect on Airbus's relationship with the Japanese government, which would be counterproductive to Airbus's potential airplane sales in Japan.

Airbus's handling of the Japanese subsidies issue has been as skilful as Boeing's attempt to not press too hard over Airbus's subsidies issues. The deft handling of the government subsidies issue is hugely important to twenty-first-century politics. A tacit agreement seemed to exist between Airbus and Boeing to not sell or transfer advanced aeronautical technology specifically to Japan, for fear that someday Japan would become a formidable competitor in commercial airplane market. However, this agreement, if it ever existed, does not seem to exist any longer as some critics including Pritchard (2002) claim that Boeing has been undertaking a technology transfer and outsourcing to Japan. Newhouse (2006) also

claims that Boeing is increasingly becoming a system integrator rather than an airframe manufacturer.

RESEARCH QUESTIONS #2:

Why was the 1992 GATT agreement kept rather peacefully for many years and why did it suddenly collapse in 2004?

Due to the influence of governments, international politics plays an important role in the acquisition decisions of airplanes by airlines. For example, British Airways (BA) had been one of Boeing's biggest loyal customers outside the US for decades, as were Lufthansa, the German carrier, Air France-KLM, the French-Dutch carrier, all of which have been big customers of Boeing 747 and other Boeing airplanes. BA operated an all-Boeing airplane fleet and was the launch customer for the Boeing 757.²⁴⁹ In 1998 BA announced an order for 220 Airbus airplanes worth three billion British pounds – the largest single deal made to Airbus by any airline outside the US at the time. The magnitude of airplane orders such as this was not unprecedented, but BA's equipment decision for Airbus airplanes appeared to be a complete reversal by an airline that had been the most loyal customer of Boeing for the past decades. Some critics commented on BA's acquisition of Airbus airplanes as a giveaway or a loss leader as the market suggested. BA got a deeply discounted airplane deal from Airbus. However, even if this were an unfair loss leader, or below cost transactions as the market price suggested, there was not much Boeing could have done because BA still remained one of Boeing's customers for the Boeing 777 and other airplanes. Therefore, it was not in the best interest of Boeing to take this to the WTO for an anti-dumping law suit case against Airbus, even if the Airbus deal

with BA was deeply discounted below cost. BA split its long-expected wide-body order between Airbus A380 and Boeing 787, – ordering 12 Airbus A380s and 24 Boeing B787s.

Air France-KLM currently operates a total of 23 747s (including 6 747 freighters) to accommodate the need for high-density passenger seats as well as providing cargo-lifting capability to meet increasing air cargo demands. In addition, a fleet of 49 Boeing 777-200/300ERs with extended range capability meet the requirement of the long-range, high-density passenger market. A fleet of 183 Airbus airplanes accommodate short- to medium-range market segments, with various sizes of airplanes ranging from the A318 with 123 seats to the A340-300 with a 272 seat capacity.

Boeing has delivered no B787 airplanes yet, but if Boeing ultimately delivers, the B787 will be an assured success over Airbus A380. Boeing B787 has more than 900 orders, including a total of 683 firm orders from 47 customers - more than four times as much as Airbus A380, which totals about 200 orders, including 185 firm orders.²⁵⁰ Boeing now has a total of over \$200 billion in commercial airplane orders, about half of them for the B787.

The long drawn-out subsidy issue is due to different business practices between Europe and the US which are associated with cultural differences in general as well as differences in corporate culture. In Europe, government subsidies are often accepted while the US business calls for free trade.²⁵¹ American corporate culture generally calls for aversion of openly outright government subsidies or cash infusions from the government, as practiced in Europe.²⁵²

The EU argued that Boeing profited from billions of dollars of lucrative US defense and NASA aerospace contracts. European companies therefore got the

same free market access like other US companies and, in fact, EADS won some of the US defense contracts. Boeing has monopolized the long-range, high-density air traffic segment with its 747 fleet since 1970 when Airbus successfully debuted its A300, a mid-range, wide-body airplane. Over the course of three decades, Airbus has quickly caught up with Boeing in the development of a similar product line of commercial airplanes comparable to the Boeing fleet, with the exception of the 747 class jumbo jet. In recent years, Airbus has finally decided to take up on Boeing's last bastion, the 747 market segment.

Airbus's idea was to supersede the Boeing 747 airplane with a "new generation," super jumbo jetliner, the A380. In this highly competitive duopoly between Airbus and Boeing, the rationale behind the Airbus A380 was based on an old concept of "hub and spokes", displacing the old technology 747 to capture the high-density traffic segment with a super triple-deck jumbo jet, the A380. Boeing counteracted Airbus's move by directly challenging the 555-800 passenger-carrying capability of the A380 with the development of a "new generation" Boeing 787 jetliner with 223-296 seat capacity to provide the direct point-to-point service to best meet passenger demands.

In the battle for the future of air travel, sales of these two competing airplanes speak for themselves: so far the Boeing 787 has raked in record-breaking sales orders and is completely booked over the next several years. The first Airbus A380 airplane delivery took place in September of 2007 after almost two-year delivery delays. Airbus completely shunned the publicity of the A380, especially its colossal size, and its enormous passenger-carrying capability.

Boeing's marketing approach for the B787, focusing on the 20 percent fuel efficiency of the airplanes, and the lower operating cost of the airplane which is

directly associated with its profitability to the customer airlines. The marketing of the B787 is focused on the passenger appeal and maximum cabin comforts for the passengers. For example, the B787 passenger cabin comforts were greatly improved by increasing the cabin comfort level.²⁵³

The first round of the long-awaited Airbus A380 vs. Boeing B787 battle was overwhelmingly won by Boeing in terms of sales results. However, in Boeing, which has had its own problems with the on-time delivery of its “new generation” high technology B787, there was no outright rejoicing over the Airbus A380’s delayed delivery, but there was a sense of conviction that Boeing could win the lucrative mid-range B787 commercial airplane marketplace. However, Boeing also ran into problems with delayed delivery of the B787 just like Airbus’s delayed delivery of the A380. Boeing announced a multiple of production delays of B787 due to technical problems, production problems, and labor problems associated with Boeing’s multiple tiers of suppliers falling behind schedule. After two-year delays, the B787 is now scheduled for flight test in late 2012.

The modern world of air travelers has changed considerably. For example, the study shows that passengers prefer a B787 direct flight (from origin to destination without connecting flight) instead of an A380 super jumbo jet flying from major airports to major airports followed by a connecting flight to the final destination on a smaller jet (“hub and spokes”).²⁵⁴ This was confirmed by the record breaking B787 sales, in direct comparison to a marginal sales result of the A380. Survival of the fittest and the wisest in a free competition could well be at the root of the overwhelming success of the Boeing B787 over Airbus A380. Clearly, Boeing’s marketing effectiveness, system integrator capability, and technological superiority of the airplane are all beginning to ripple across this highly competitive duopoly

competition between the two airframe manufacturers. This competition process is at the core of the next phase of competition between the Boeing B787 and the Airbus A350, both of which are currently being developed. The final result of the competition between the Boeing B787 program and the Airbus A350 program will be seen in years to come, because these airplane programs normally develop into generations of derivative airplanes. For example, the Boeing 747 programs outlasted many other airplane programs over the last three decades starting from the original model 747-100 which developed into more improved and enhanced models followed in the 747-200, -300, -400 series, to the current 747-8 series.

Airbus and Boeing are deploying diverging strategies for commercial airplanes. Airbus's strategy focuses on the 'hub and spokes' concept to displace Boeing's 747s with the high-capacity seating from 555 to 800 passengers, long-range super jumbo A380 focused on flights between major hub airports to capture high-density passenger segments, from which smaller airplanes carry passengers to the final destinations. On the other hand, Boeing's strategy is the "new technology" B787, long-range two-engine wide-body airplane that will fly directly to destinations further apart. Airbus argues that the level of passenger cabin comforts will be matched by the A380, and that seat-mile costs of the A380 are 15 to 20 percent lower than Boeing 747.²⁵⁵

In previous decades, repeating the mantra of a "level playing field"²⁵⁶ (fair and free competition) seems to have been Boeing's approach to best protect its own business interests. The US government seems to have understood this delicate balance of pressing European governments not too hard but putting enough pressures on to get some result for Boeing. In this way, Boeing continued business as usual and made contributions toward the US balance of trade.

Today, Boeing plays a significant role as a major US defense contractor of particular importance to US national defense and security. Large commercial airplanes like the Boeing 747, for example, can be of critical importance in case of a US national emergency. The 747 fleet of the US flag carriers is a part of the US national emergency preparedness: the 747 fleet of US flag carriers can be deployed for large-scale mass evacuation from earthquakes, tsunamis, volcano eruptions, and evacuation of US citizens trapped in the hostilities and war outside of the US.

The EU's continued subsidies, which have already helped Airbus surpass Boeing by capturing a major market share in 2003, could be regarded as counterproductive and potentially as having a negative effect on US interests. Therefore, Boeing is important for the interests of the US government in terms of US defense and security. This is directly contrasted to Boeing's position back in the late 1960s when Boeing had no significant role in the US Defense Department as a major contractor, nor in relation to national security. Boeing's predicament of near bankruptcy in the late 1960s was clearly evinced in the US government's hands-off policy towards Boeing. Today, Boeing has a critical function to perform in the US government's defense and, national security, and makes significant contributions to the US balance of trade. Therefore, the EU-US subsidy disputes need to be resolved in the best interests of both the EU and the US to ensure that Airbus and Boeing compete in a "level playing field" in the free marketplace.

The EU's approach to protecting Airbus favors safety nets and industrial policies that help Airbus to overtake or drive its competitors out of the marketplace, while the US approach to supporting its large commercial airplane industry is more complex, partly due to the unique climate of American corporate culture and its

aversion to government subsidies which are often associated with state controlled welfare state.

However, in the highly competitive environment of the duopoly between Airbus and Boeing, both sides required billions of dollars in R&D expenditures for their new airplane programs – Boeing's "new generation" airplane, the B787 and also Airbus's new A350 program currently being developed. So how did Airbus and Boeing finance these "new generation" airplane programs? While Airbus's intransigence on subsidy disputes is palpable, at least one third of Airbus's R&D expenditures for the super jumbo A380 were financed through EU government subsidies, which Airbus legitimized by the now-defunct 1992 GATT bilateral pact.

In fact, since the advent of the 747 in 1970 that made a revolutionary change the way people around the globe travel, Boeing has been the front-runner as a model for operating in a global economy. In the 1980s, Boeing spearheaded outsourcing aircraft parts and soon started manufacturing major portions of airframe outside of the US against the stiff opposition of unionized American workers. Boeing's rationale behind building airplanes outside of the US was straight forward – it's for survival to become competitive in a global economy by bringing down the cost of building airplanes.

Boeing has been an airframe manufacturer of the most innovative "new generation" airplane, the B787, and the current production airplanes including 737, 747, 767, and 777. However, in the 1990s Boeing was heading towards increasingly becoming "simply a system integrator" rather than an airframe manufacturer by giving a great deal of control over designing and building the major portion of airframe manufacturing to Boeing's risk-sharing partner suppliers. Surprisingly, Boeing has devolved tasks to its major suppliers including designing

and building of wings because the technology of wings has been long regarded as a well-guarded secret and a core technology at Boeing.

Many of the US's arguments about the government subsidies are presented in lengthy detailed legal documentation. The US counter-argued Airbus's assertions in compliance with the 1992 bilateral agreement. The US documents were prepared by Boeing's in-house lawyers,²⁵⁷ with the legal expertise of reputable American law firms retained by Boeing, and a team of US government attorneys. The US documents are persuasive, effective, and water-tight from a legal standpoint. Therefore, the US arguments were most likely to withstand and prevail at the WTO court.

What are the EU's overall strategy and approach to countering the US arguments? In comparison with the US legal argument, the EU's arguments included every conceivable argument that they could find. Their main argument was that the spin-off from the heavy US investment in military airplane technology benefited the commercial airplane programs of Boeing. Basically, the Europeans have produced every conceivable argument that they might possibly be able to make. For example, the European Commission argued that Boeing received \$23.7 billion in subsidies (shown in the Exhibit 9: An overview of US subsidies to Boeing's large civil aircraft. Source: European Commission). That leaves Airbus's over-all arguments as unbelievable and less convincing.

Airbus should have taken a more sophisticated legal approach to the case, because there is what is called a "gray area" in Boeing arguments. Boeing's loss of market share in 2003 made Airbus a leader of the industry. Boeing blames this loss entirely on the subsidies that Airbus received from the EU governments. However, it is also due to Boeing's sales and marketing strategies which did not sell

as many airplanes as Airbus did. Therefore, Airbus could have increased the odds by highlighting Airbus's superior management, sophisticated advanced marketing/sales endeavors against Boeing's mismanagement that caused Boeing's steady market share loss. In fact, Boeing's top management might not have been in top shape during the years 2003 to 2005. Boeing ex-Chairman and CEO (Chief Executive Officer) Phil Condit resigned in 2004. In a typical American corporation, a CEO has an enormous power associated with its major responsibility for the corporate profit and loss toward maximization of the stockholder's wealth.

There are fundamental differences in the *modus operandi* and "rules of engagement" in the free competition between Airbus and Boeing in the way they operate in business. If the economy slows down and airplane orders dwindle, Boeing almost always resorts to laying-off of its surplus production workers to minimize the risk of corporate loss. For example, when airplane demand fell off in 1992, Boeing started laying off 28,000 people, or 20% of its workers, over the next two years it slashed production by 47 percent including its 737 and 757 in Renton and its wide-body 767 and the jumbo 747 in the Everett plant.

Airbus did not always resort to an American way of solving a business slump. If Boeing's "new generation" 787 airplane program does not succeed, Boeing's risk-sharing partners, the Japanese "three heavies", shares the loss with Boeing. The Japanese "three heavies" presumably took most of the loss as in the case of the failed 7J7. Without the Japanese risk-sharing partners, Boeing faces great exposure, taking a risk of losing perhaps billions of dollars and going out of business. If Airbus's super jumbo A380 program does not succeed, Airbus does not have to pay back the money that the EU governments loaned out to Airbus for the airplane program that failed.

In the world of the capital-intensive, high-risk large commercial airplane business, Airbus and Boeing both deploy the most effective and efficient ways of developing billions of dollars' worth of new airplane programs like the Boeing 787 and Airbus A380. Boeing has been practicing an innovative fail-safe risk-sharing venture with the Japanese three "heavies" backed by the investment of the Japanese government. Boeing's joint risk-sharing venture with Japan works like a double-edged sword in the world of making and marketing large commercial airplanes. On the manufacturing front, because of the American aversion of government subsidies, Boeing relies heavily on the Japanese government's subsidies in lieu of the US government's subsidies.²⁵⁸

The Europeans openly favor the government subsidies that provide the safety-nets to Airbus and the industrial policies that help protect their most capital-intensive commercial airplane industry. Duopolists Airbus and Boeing do not want to drive each other out, because if Boeing wasn't there, as a major competitor, Airbus would not continue receiving subsidies. However, Airbus has developed its cost efficiency, perhaps better than Boeing, and does not need subsidies any longer.

RESEARCH QUESTIONS #3:

What has the intensity of duopoly competition brought about?

Airbus's vertiginous descent in recent years started with the A380 fiasco, in which there were – almost two-year production delays and cost overrun in the production of the super jumbo A380, due to a series of mismanagement problems in an attempt to displace the dominant Boeing B747. However, the intense duopoly

competition led to a price war between Airbus and Boeing: as result, Airbus captured one hundred percent of the no-frills airline market. However, Boeing responded with the most fuel efficient “new generation” B787: – a smaller (223 - 296 seats), medium-range (non-stop flight distance) airplane with reduced emissions and an emphasis on fuel economy. Both Airbus and Boeing became more efficient in production and came up with the most fuel efficient airplanes, Boeing B787 and Airbus 350.

Since its inception in 1970, Airbus received launch aid from the EU governments for every single new airplane in the form of subsidies. American competitiveness was challenged by Airbus as it quickly started catching up with dominant American companies by developing a range of product lines comparable to Boeing's. The Bush administration was concerned about American airframe manufacturers of large commercial airplanes facing the European competitors heavily subsidized by the EU governments. So the general consensus by Boeing and the US government was to set a limit on Airbus's sustained use of the EU government subsidies. The US and the EU governments started negotiations to limit European subsidies, which led to a subsidies agreement between the EU and the US governments in 1992. The agreement set a limit on European governments' subsidies to no more than one-third of the R&D costs of a new airplane. Boeing wanted to seek less than one-third of the R&D costs but ended up supporting the subsidies agreement in 1992. The subsidies agreement allowed R&D expenditures only exclusive of production subsidies. However, as the 1992 agreement legitimized the EU governments' continued subsidies to Airbus, McDonnell-Douglas was squeezed between the two strong competitors, Airbus and Boeing. Although

McDonnell-Douglas was still in business, duopolistic competition was beginning to take shape between Boeing and Airbus.

McDonnell-Douglas started seeking a partnership to save its commercial airplane business. As Airbus continued developing its product line with the aid of government subsidies, Airbus's market share continued expanding at the expense of Boeing. The 1992 subsidies agreement was meant to set a limit on Airbus's use of subsidies. Instead, the subsidies agreement provided Airbus with a great advantage: a legitimate use of EU governments' subsidies. The same subsidies agreement made the US government agree to the right of the European governments to subsidize their commercial airplane industry. Therefore, since 1992 Airbus had used the 1992 bilateral pact as a justification for the EU governments' subsidies. However, right from the beginning the US government started complaining that European governments have to stop subsidizing Airbus.

By the time Boeing merged with McDonnell-Douglas in 1997, Airbus had become a major threat to American competition. During the four-year period between 1995 and 1999, Boeing held the major market share and Airbus shared about one-third of the market share in terms of number of airplanes delivered. A few years after the 1997 merger with McDonnell-Douglas, Boeing discontinued production of McDonnell-Douglas commercial airplanes altogether. Airbus's market share had been increasing steadily, and by 2003 Airbus overtook Boeing.

US politicians saw the damage caused by Airbus's sustained use of the EU governments' subsidies when Airbus overtook Boeing leadership position in 2003. It is possible that Airbus's sustained use of government subsidies could eventually drive Boeing out of the market. The issues of Airbus subsidization became more pressing to Boeing in the second half of 2004 when Boeing faced the

critical problem of Airbus's new subsidies for the A350, as Airbus's market share continued to outpace Boeing's.

Twelve years after the 1992 subsidies agreement, in early 2004, Boeing finally came to a realization that it had lost out on its decades-long leadership position to Airbus in the large commercial airplane industry. Airbus institutionalized its sustained use of government subsidies under the auspices of the GATT bilateral pact. However, Boeing realized that Airbus no longer needed European government subsidies. The 1992 GATT agreement was no longer relevant and needed a new agreement was needed. Therefore, the US government terminated the 1992 subsidies agreement in 2004 and filed a complaint against Airbus in the WTO court.

After merging with McDonnell-Douglas in 1997, Boeing was no longer an export-dependent commercial airplane company. Boeing has become a major contractor of the US Department of Defense, carrying increasingly more weight in Washington and the US Congress. In addition, Boeing is armed with high caliber legal defense and professional legal expertise with its in-house lawyers including a former US judge.²⁵⁹ Boeing was ready to take on Airbus at the WTO court.

Not only had the 1992 agreement outlived its usefulness, but subsidy-driven Airbus also forced Boeing to trail Airbus in 2003. The termination of the 1992 GATT agreement had implications for American competitiveness in the large commercial airplane industry as well as political and economic implications in so far as this relates to US trade policy. In fact, the 1992 GATT bilateral agreement between the EU and US governments made the US agree to the European governments' subsidization of Airbus.

Consequently, US Trade Representative (USTR) Robert Zoellick started putting pressure on the EU through his continued dialogues about ending new

subsidies with EU Trade Commissioner Pascal Lamy in late spring and early summer in 2004. USTR and EU trade officials had a meeting in July 2004 in order to secure a commitment to end new subsidies. The subsidy disputes soon escalated to become a US presidential issue. And in August 2004, President Bush instructed USTR Zoellick to pursue all possible avenues to end Airbus's subsidies including the option of filing a WTO case. Subsequently, USTR Zoellick met with EU trade officials and EU Trade Commissioner Lamy in late September 2004 to discuss how to end the subsidies through the negotiation of a new bilateral agreement. However, the EU remained opposed to the goal of ending all new subsidies for large civil aircraft, not to mention on how to achieve this goal.

The United States was committed to resolving the subsidies to Airbus through negotiation. However, considering the EU's unwillingness to end subsidies through negotiations, filing a WTO case became quite necessary to ensure, one way or another, a leveling of the playing fields. It became very clear to the US that the 1992 agreement had outlived its usefulness and no longer reflected current political-economic and market realities.

The 1992 EU-US bilateral agreement was a truce between the EU and the US because the Americans had for years complained about the \$26 billion in subsidies that were supposedly provided to Airbus. However, the real amount of subsidies that the EU government had provided to Airbus was not known. The agreement was meant to remove Airbus's advantage of an unlimited sustained use of government subsidies and therefore to reduce launch aid. However, instead of reducing launch aid, the US agreed to the right of the EU governments to continue subsidizing Airbus as before. The 1992 agreement allowed the EU governments to institutionalize the launch aid mechanism that provided Airbus with unique

advantages over Boeing in developing new airplane programs, including Airbus's new production airplane, the super jumbo jet A380 and the latest A350 airplane scheduled for delivery in 2012.

The implication of the 1992 bilateral agreement was that the US government confirmed the right of other governments to subsidize their industries. Therefore, the 1992 agreement posed a serious question for US trade policy. The US critically needed a consistent and coherent trade policy for dealing with other governments, including a sustainable policy for dealing with EU governments. Both US and EU governments needed a new trade agreement that reflected the realities of current marketplace, in order to best meet the mutual interests of the US and the EU governments.

The WTO served as an agreed multilateral forum for resolution of the trade disputes. However, Boeing had been pressed by Airbus's steadily increasing market share outpacing Boeing's diminishing share. After unsuccessful government-to-government attempts to resolve the issue, the US terminated the 1992 GATT bilateral agreement and registered formal complaints against Airbus at the WTO over the EU's sustained "launch aid" to Airbus.

What really triggered the US termination of the 1992 bilateral agreement is the fact that Airbus finally overtook Boeing in 2003 in terms of market share. The US asked the EU to negotiate a new agreement in the framework of rules established by the WTO, which does not support Airbus launch aid. Boeing's termination of the accord is viewed by some critics as a strategy ploy to press Airbus to delay the launch aid to redesign its new long-range A350, which will be directly competing against Boeing's B787²⁶⁰. The subsequent discussions between the EU and US governments did not result in agreement. Boeing viewed the Airbus

subsidies as causing market distortion in the commercial airplane duopoly marketplace. The US government sought to make the EU subsidies to Airbus cease so that the airplane marketplace won't be distorted by such subsidies. Boeing fully supported the action taken by the US government.

So where are the disputes heading? The subsidy disputes will be mitigated by the fact that Airbus and Boeing both want to continue getting government subsidies and have little desire to reverse the situation. Both companies cannot operate completely free of subsidies. Both the EU and US governments want their large commercial airplane makers to succeed and to continue contributing to the nation's balance of payments. Furthermore, both Airbus and Boeing potentially play a vital role in national security and emergency action.

The preliminary ruling of the WTO sided with Boeing in late 2009. By the end of 2010, there was much clearer picture of the trajectory of the EU-US airplane subsidy disputes at the WTO. And also the US's attempt to prevent EU governments' continuous subsidy to Airbus was not as pressing as it was since 2008 when Boeing experienced record breaking success with the "new generation" 787 airplane sales in contrast with the disastrous sales and the resulting financial fiasco of Airbus's super jumbo jet A380.

This situation, however, still leaves the unsolved question: What is the right thing for Airbus and Boeing to do? Airbus-Boeing competition is beneficial to the extent that the economy and the competition operate on fair trade principles. Airbus and Boeing both strive for superiority in the commercial airplane marketplace. Boeing stayed competitive and survived against Airbus's duopolistic competition backed by "soft loans" from EU governments from 1998 to 2009. Robert Keohane advanced the arguments that a subsidy neutral condition was not always

the most crucial factor ensuring the sustainability of duopolistic competition, but rather the political power of the state (i.e. the power of the US in case of Boeing) is a bigger factor. The international system ensures all states heed to the rule of a “level playing field” regardless of the willingness of participating states. However, according to the theory advanced by Keohane, if the US’s market leadership declines, the international system becomes exposed to unfair competition.

What are the critical factors for sustaining duopolistic competition between Airbus and Boeing? The US’s powerful hegemonic leadership from the 1960s to the early 1970s had the capability to ensure compliance with free trade and free competition rules to stabilize the international system. Airbus and Boeing, as the two equally powerful commercial airframe manufacturers, continued to stabilize the industry by precluding the entry of any potential newcomer from 1998 to 2009 in a fiercely competitive duopolistic competition.

The commercial airplane industry has been stable for over three decades because of these huge barriers to entry and Boeing’s complete domination in the market since 1970. However, Boeing domination of the industry has been replaced by Airbus’s emerging leadership in recent years. The high barriers to market entry are characterized by high R&D investment requirements for “new generation” technology airplanes, and the highly competitive Airbus-Boeing duopolistic share of the marketplace. Since Boeing merged with McDonnell Douglas in late 1997, the industry has been effectively in duopoly competition between Airbus and Boeing in the production of large commercial airplanes.

Is the Airbus-Boeing strategic duopoly sustainable? In answering this question, first, this research has identified the contributing factors and conditions for the sustainability of Airbus-Boeing duopolistic competition. Second, the research

has explained the assumptions of sustainability by examining the connections between the quantifiable tangible corporate resources, and intangibles such as system integration capabilities, economy of scales, and political powers.

The duopolistic stability of Airbus-Boeing competition from 1998 to 2011 can be explained by Robert Keohane's neo-realist version of hegemonic stability theory.²⁶¹ Keohane's theory suggests that states are the most important actors in the international system. However, the theory suggests that when the hegemonic leadership declines, the system becomes exposed to economic instability and violence. Quite clearly, the US had been taking a hegemonic leadership for decades: since the end of World War II, followed by the Cold War between the US and the former communist bloc led by the USSR and Communist China. The world has since changed for the better, with the political-economic system moving towards free economy and free trade, joined by Russia and its former USSR's satellite countries. China actively participates in the free enterprise system of the world while it remains the only country (besides Cuba) under the unique socialistic principle of state ownership.

In June 2011, the US argued before the Dispute Settlement Body (DSB) at the WTO.²⁶² Launch aid and other subsidies to Airbus added up to some \$18 billion which benefitted Airbus but caused adverse effects on Boeing's market share. These illegal subsidies greatly helped Airbus to develop a full product line of large commercial airplanes, which enabled Airbus to eventually capture a major market share. Therefore, the Dispute Settlement Body will rule that the EU and the member state subsidies breached the WTO obligations.

Airbus did not entirely rely on commercial financing based on an on-going interest rate available in the financial market. Instead, Airbus continued benefitting

from European government subsidies. Airbus's repayment of the "launch aid" was either tied to, or entirely dependent on, successful sales of the new Airbus airplane models.²⁶³ If a particular airplane model did not sell well then Airbus did not have to repay the financing cost to the EU governments. The US argued that the Airbus A380 "super jumbo" airplane program alone received approximately \$3.7 billion in "launch aid" from France, Germany, Spain, and the United Kingdom.²⁶⁴

The WTO Appellate Body concluded that "either directly or indirectly, launch aid was a necessary precondition for Airbus's launch of the A380" in 2000 and that it would not have been possible for Airbus to launch the A380 in 2000 by financing entirely at a commercial market rate. The Appellate body declined the EU's argument that, even without any "launch aid", Airbus could have launched an A320 series of airplanes in 1987 and an A330 series of airplanes in 1991. The Panel and Appellate Body have concluded that without "launch aid" these Airbus airplanes would not exist today.

The Panel and the Appellate Body's findings confirmed the long-term adverse effects of the EU's subsidies to Airbus on the US large commercial airplane industry.²⁶⁵ The EU's subsidies to Airbus caused the market share loss to Boeing in some of the world's largest commercial airplane markets including Europe and China. In addition, Boeing lost sales of hundreds of airplanes in sales campaigns involving ten major airline customers. The lost sales of hundreds of airplanes is particularly significant in view of the fact that the annual output of the US large commercial airplane industry constitutes about three to four hundred airplanes.

Furthermore, the United States claimed that the EU still continues to subsidize Airbus. The Panel and Appellate Body supported the US claims regarding a number of other payments that the EU and some member states made to Airbus

in subsidized terms and found that these payments harmed the US large commercial airplane industry. The Appellate Body confirmed that France and Germany subsidized Airbus by providing equity financing worth \$1.6 billion at a time when no commercial investor would have made such investments.²⁶⁶ The Appellate Body also confirmed that EU member states provided WTO-inconsistent subsidies to Airbus through infrastructure payments which are worth more than \$1.2 billion.²⁶⁷

The EU is now into its fifth decade of providing Airbus with massive amounts of market-distorting launch aid to its airplane models. Consequently, the launch aid continues helping Airbus to sustain a major share of the global market for large commercial airplanes. However, the continuation of the decades-long launch aid to Airbus is finally coming to a stop.

The Panel and the Appellate Body at the WTO confirmed that the EU governments' subsidies violated WTO rules and thereby affirmed what the United States told the Appellate Body six years ago –: that launch aid conferred immense subsidies to Airbus that caused serious harm to the US interests. Airbus is presently getting launch aid for its latest airplane model, the A350. The US strongly argued that the on-going funding to Airbus is no longer acceptable and that the EU governments need to comply with their obligations to withdraw the subsidies or remove their adverse effects within the six-month period.²⁶⁸

After the lengthy legal proceedings, the Panel and Appellate Body at the WTO finally concluded that, without launch aid, Airbus and its fleet of airplanes would not have existed today. Without Airbus, it is most likely that Boeing would have been in a dominant monopoly position in the global marketplace.²⁶⁹ Therefore, the Panel and Appellate Body at the WTO will rule that the EU and its member states will have to take appropriate steps to withdraw the subsidies or remove the

adverse effects within six months, according to the statement by the United States at the June 2011 Dispute Settlement Body meeting. The US also stated that the EU and its member states must still comply with the Dispute Settlement Body's recommendations and rulings, once adopted, "even without prohibited subsidies findings".

In light of the WTO ruling, a self-restraint fifty percent market share rules may be needed for the Airbus-Boeing duopoly competition. As for Airbus, adherence to the fifty percent market share will enable to reduce the further exposure of Airbus's reputation of the EU Government subsidy. Therefore, it is expected that the EU Governments would comply with the WTO ruling. The case has been one of the most closely watched government subsidy disputes between the EU and the US because of the precedents that this case could set for other. The legal setback for the EU could possibly set a precedent for the US to challenge EU's Governments' subsidies to some other export industries as well.

CONCLUSIONS OF THE RESEARCH QUESTIONS

This section reevaluates the core research questions and answers in the light of detailed analyses of the EU-US disputes in the previous chapters 2 to 7 in order to identify core factors and the driving forces that might have led to different paths towards different future outcomes.

We developed the key research questions at the outset of the research which certainly did us good as the guiding light in the fog in terms of where we were heading and what we are supposed to get. However, the shortcoming of the research questions is that we always had a nagging feeling that we might have

missed out the big tree in the forest. But, of course, the strong point of the research questions are the total focus on the research endeavors toward accomplishing the research objectives that one set out to accomplish within the timeframe. As we have researched what we set out to accomplish, we have identified myriad of other research opportunities that we almost wished to expand the thesis to spheres of other academic disciplines including marketing/sales competition between Airbus and Boeing.

EXPLANATIONS ON THE HYPOTHESES

The four hypotheses which were developed at the outset of the thesis can be explained as follows:

Hypothesis 1. Without the continued 'launch aid' from the EU governments, Airbus would not have been able to speed up the development of a full product line comparable to Boeing's:

It is the widely known fact that over the four decades since its inception, Airbus has been and still is subsidized by the European governments. Therefore, the governmental subsidy issue remains to be the root cause of the on-going EU-US airplane subsidy disputes. Foregone conclusion is that without the "launch aid" Airbus would never have been able to compete head-to-head with Boeing nor have been able to develop a full product line of airplanes. The EU governments continue financing Airbus airplane programs for the A380 super jumbo airplane and the on-going A350 mid-range "new generation" airplane program at a below market rate.

Hypothesis 2 Without the sustained use of the EU Government subsidies, Airbus would not have been able to surpass Boeing and capture the major market share for several years since 2003:

Without continued government subsidies from the EU governments, it is least likely that Airbus has been able to develop a full product line of airplanes in a quick succession and overtake Boeing and achieve the dominant market share without any hurdle.

Hypothesis 3. Without the continued subsidies from the EU governments, Airbus would not have been able to achieve its overall production cost efficiency and production of high quality airplanes:

Airbus has been able to attain a high level of cost efficiency and produce high quality airplanes with the governmental aid. Airbus wouldn't have been able to succeed without it.

Hypothesis 4. Boeing terminated the 1992 GATT agreement in order to pressure Airbus to cut off or delay the continued 'launch aid' for Airbus's new airplane program:

Although the 1992 GATT bilateral became dated, the key reason for the termination of the agreement is Airbus's continued use of the "launch aid" for its new airplane development at any time Airbus wants it. Therefore, Boeing attempted to intercept Airbus's free access to the governmental subsidy at any time Airbus wants it.

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APPENDICES

Exhibit 1 Airbus vs. Boeing Market Share (%) by the Number of Airplane Delivered

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Airbus	33%	32%	33%	29%	33%	39%	39%	45%	52%	53%	57%
Boeing	54%	55%	58%	71%*	67%	61%	61%	55%	48%	47%	43%

Source: Adapted from Airline Business Magazine (Time, January 24, 2005, p37) and Wall Street Journal Europe.

*Note: Boeing figures from 1998 reflect the 1997 merger with McDonnell Douglas, but Douglas airplane production was discontinued soon afterward.

Exhibit 2 Boeing Airplane Orders – New Net Orders for 2005 vs. 2006

Years	Single Aisle Airplanes	Twin Aisle Airplanes					Single and Twin Aisle Airplanes
	737	747	767	777	787	Total	Grand Total
2005	569	43	15	154	235	447	1,016
2006	729	72	10	76	157	315	1,044

Source: The Boeing Company

Note: Figures are adjusted for cancellations and conversions as of December 31, 2006.

Exhibit 3 2001-2005 Boeing Financial Highlights

(US dollars in millions except per share data)

	2005	2004	2003	2002	2001
Revenues	54,845	52,457	50,256	58,831	57,970
Net Earnings	2,572	1,872	718	492	2,827
Earnings per share*	3.19	2.24	0.85	2.84	3.40
Operating margins	5.1%	3.8%	0.8%	6.4%	6.2%
Contractual backlog**	160,473	109,600	104,812	104,173	106,591

Source: The Boeing Company's 2005 annual report.

*Before cumulative effect of accounting change and net gain (loss) from discounted operations.

**Commercial Airplanes backlog at December 31, 2005, has been reduced by \$7.8 billion to reflect the planned change in accounting for concessions effective January 1, 2006.

Exhibit 4 2003-2006 Boeing Annual Orders Summary

2006 Annual Orders Summary

	737	747	767	777	787	TOTAL
Gross	733	72	8	77	160	1,050
Net	729	72	10	76	157	1,044

Note: Gross Orders does not include cancellations or conversions.

Net Orders in year of cancellations adjusted for current year cancellations/conversions.

Source: The Boeing Company

2005 Annual Orders Summary

	737	747	767	777	787	TOTAL
Gross	574	48	19	153	235	1,029
Net	569	43	15	154	235	1,002

Note: Gross Orders does not include cancellations or conversions.

Net Orders in year of cancellations adjusted for current year cancellations/conversions.

Source: The Boeing Company

2004 Annual Orders Summary

	737	747	767	777	787	TOTAL
Gross	152	10	9	42	56	277
Net	147	10	9	42	56	277

Note: Gross Orders does not include cancellations or conversions.

Net Orders in year of cancellations adjusted for current year cancellations/conversions.

Source: The Boeing Company

2003 Annual Orders Summary

	737	747	757	767	777	TOTAL
Gross	197	4	7	11	13	240
Net	206	4	-1	10	12	239

Note: Gross Orders does not include cancellations or conversions.
 Net Orders in year of cancellations adjusted for current year cancellations/conversions.
 Source: The Boeing Company

Exhibit 5 Boeing 787-8 versus Airbus 350-800

	Boeing 787-8 (1st flight: 2010)	Airbus 350-800 (due 2014)
Engines	GEnx (GE); Trent 1000 (Rolls-Royce)	Trent XWB (Rolls-Royce)
Passenger Seats	210 to 250 seats	270 seats
Range	Up to 8,200 nautical miles	8,300 nautical miles
Fuel Efficiency	20% less than 767-300ER	25% less than 777-300ER
List Price	\$157 million to \$167 million	\$199.3 million
Orders	900, worth about \$82.4 billion	109, worth about \$21.7 billion
Cruising Speed	Mach 0.85	Mach 0.85
Materials	50% composites; 20% aluminium; 15% titanium, 10% steel; 5% other	52%composites;20% aluminium; 14% titanium; 7% steel; 7% other

Source: Coco Masters/Everett, in Global Business, Time Magazine, Sept. 17, 2007.

Exhibit 6 Boeing 787 - Global Airframe Manufacturing Effort

AIRFRAME	SOURCING
Wheel well/box	Japan
Forward fuselage	Japan
Wings	Japan
Engine/landing gear	Britain
Horizontal stabilizer/center fuselage	Italy
Trailing edge	Australia
Wing tips	South Korea
Forward fuselage	Kansas, USA
Engine/housing	Ohio and California, USA
Leading edge	Oklahoma, USA
Aft fuselage	South Carolina, USA
Tail fin	Washington, USA

Source: The table was constructed based on data from Boeing.

Exhibit 7 Length of Time Required for Settlement Procedure by Stage

STAGE BY DISPUTE SETTLEMENT PROCEDURES	TARGET TIME
Consultations, mediation, etc.	60 days
Panel set-up and panelists appointed	45 days
Final panel report to parties	6 months
Final panel report to WTO members	3 weeks
Dispute settlement body adopts report (if no appeal)	60 days
Without appeal	Total = 1 year
Appeals report	60-90 days
Dispute settlement body adopts appeals report	30 days
With appeal	Total = 1 yr. 3 mo.

Source: The table was constructed based on the primary data source from WTO.

Exhibit 8 Main Stages of the Panels' Work

MAIN STAGES	DESCRIPTION OF PANELS' WORK
Before the first hearing	Each side in the dispute presents its case in writing to the panel.
First hearing	The case for the complaining country and defense. The complaining country or countries, the responding country, and those that have announced that they have an interest in the dispute, make their case at the panel's first hearing.
Rebuttals	The countries involved submit written rebuttals and present oral arguments at the panel's second meeting.
Experts	If one side raises scientific or other technical matters, the panel may consult experts or appoint an expert review group to prepare an advisory report.
First draft	The panel submits the descriptive (factual and argument) sections of its report to the two sides, giving them two weeks to comment. This report excludes findings and conclusions.
Interim report	The panel then submits an interim report, including its findings and conclusions, to the two sides, giving them one week to ask for a review.
Review	The period of review must not exceed two weeks. During that time, the panel may hold additional meetings with both sides.

Final report	A final report is submitted to the two sides and three weeks later, it is circulated to all WTO members. If the panel decides that the disputed trade measure does break a WTO agreement or an obligation, it recommends that the measure be made to conform with WTO rules. The panel may suggest how this could be done.
Report - DSB's ruling	The report becomes the Dispute Settlement Body's ruling or recommendation within 60 days unless a consensus rejects it. Both sides can appeal the report.

Source: The table was constructed based on the primary data source from WTO.

Exhibit 9 Overview of US Subsidies to Boeing's Large Civil Aircraft (LCA) Division

Entity	Name of Subsidy	Description of Subsidy	Total Amount (USD millions)
State of Washington and Municipalities Therein	HB 2294 Tax Incentives	State of Washington provides LCA-related: (1) business and occupation ("B&O") tax rate reductions; (2) B&O tax credits; (3) sales/use tax exemptions; (4) leasehold excise tax exemptions; and (5) property tax exemptions.	3,456.7
	Everett B&O Tax Rate Reductions	City of Everett reduces the B&O tax rate paid by Boeing on LCA manufactured in Everett.	67.5
	Project Olympus Master Site Agreement Subsidies	State of Washington and municipalities therein: (1) provide coordinators to facilitate 787 production; (2) provide job training incentives for 787	395.8

		employees; (3) provide Boeing's 747 LCF with the same incentives accorded to the 787; (4) assume certain litigation cost; and (5) provide infrastructure-related subsidies to facilitate Boeing's LCA production in Everett, Washington.	
State of Kansas and Municipalities Therein	Wichita IRB Tax Breaks	City of Wichita provides property and sales tax breaks to LCA component production facilities in Wichita through the issuance of industrial revenue bonds.	783.7
	KDFA Bonds	State of Kansas pays the interest on bonds that will be used to facilitate production of a portion of the 787 fuselage.	122.0
State of Illinois and Municipalities Therein	Boeing Relocation Package	Pursuant to the relocation package for Boeing: (1) State of Illinois reimburses cost related to the relocation of Boeing's headquarters; (2) State of Illinois provides Boeing's headquarters with income tax credits; and (3) City of Chicago and Cook County provide property tax abatements for Boeing's headquarters.	24.3
	Retirement of the Former Lease	City of Chicago pays to retire the lease of the former occupant of Boeing's headquarters in Chicago.	0.5

Source: European Commission

**Exhibit 9 Overview of US subsidies to Boeing's Large Civil Aircraft (LCA) division
(continued)**

Entity	Name of Subsidy		Description of Subsidy	Total (USD Mil.)
US Government	US Aeronautics R&D	NASA ACT Program	NASA funds R&D related to composites technologies that will be utilized on the 787.	417.7
		NASA HSR Program	NASA funds R&D related to high speed civil aircraft technology that also has applications for Subsonic LCA.	1,314.4
		NASA AST program	NASA funds R & D related to improving environmental impact, safety, and efficiency of LCA.	692.5
		NASA HPCC Program	NASA funds R&D related to computing and communications technology for the design and development of LCA.	352.8
		NASA Aviation Safety Program	NASA funds R&D related to improving the safety of LCA.	804.1
		NASA QAT Program	NASA funds R&D related to noise reduction technology for LCA.	103.7
		NASA Vehicle Systems Program	NASA funds R&D related to improving environmental impact and efficiency of LCA.	902.9
		NASA R&T Base Program	NASA funds R&D related to basic and applied advanced LCA technologies.	5,818.3
		DOD RDT&E Program	DOD funds R&D related to dual-use technologies – i.e., technologies applicable to both military and commercial aircraft.	2,379.0
		DOC Advanced Technology Program	DOC funds R&D related to high risk, high pay-off, emerging and enabling	4.6

			technologies applicable to LCA.	
	NASA/DOD Intellectual Property Right Waivers/Transfers		NASA and DOD transfer to Boeing valuable patent rights, rights to trade secrets, and exclusive rights to certain data for LCA-related and other technologies.	726.4
	NASA/DOD IR&D/B&P Program		NASA and DOD reimburse Boeing for its own independent LCA R&D that is not related to any specific contract, as well as for its bid and proposal costs.	3,108.3
	NASA/DOD Facilities, Equipment and Employees		NASA and DOD provide their facilities, equipment, and employees for LCA-related R&D.	N/A

Source: European Commission

Exhibit 9 Overview of US subsidies to Boeing's Large Civil Aircraft (LCA) division (continued)

Entity	Name of Subsidy	Description of Subsidy	Total Amount (USD Mil.)
US Government (continued)	DOL 787 Worker Training Grants	DOL provides grants to help train 787 workers.	1.5
	FSC/ETI	The US Government lowers taxes paid by Boeing on each LCA produced and sold for use outside the United States.	2,199.0
TOTAL			23,675.5

Source: European Commission

Exhibit 10 Single-Aisle Passenger Airplanes

More than 175 seats	90 to 175 seats	Regional jets
Boeing 707, 757 Boeing 737-900ER Airbus A321 Boeing/MDC DC-8 Tupolev TU-204, TU-214	Boeing 717-200, 727 Boeing 737-100 through -500 Boeing 737-600, -700, -800 Airbus A318, A319, A320 Boeing/MDC DC-9, MD-80, -90 Fokker 100 BAe 146-300, Avro RJ100 <u>Embraer 190, 195</u> <u>Bombardier CRJ-1000</u> Yakovlev Yak-42 Tupolev TU-154 Ilyushin Il-62 AVIC ARJ-900	Dornier 328 Jet Fokker 70 BAe 146-100, -200 Avro RJ70, RJ85 <u>Bombardier CRJ</u> <u>Embraer 170, 175</u> ERJ-135, -140, -145 Sukhoi Superjet 100 Antonov An-148 Tupolev TU-134 Yakovlev Yak-40 AVIC ARJ-700

Source: Boeing Current Market Outlook 2007

Exhibit 11 Twin-Aisle Passenger Airplanes

Large	Medium	Small
3 class: More than 400 seats	2 class: 310 to 400 seats 3 class: 250 to 370 seats	2 class: 230 to 310 seats 3 class: 180 to 250 seats
Boeing 747 Airbus A380	Boeing 777 Airbus A330-300, A340 Airbus A350-900, -1000 Boeing/MDC MD-11 Ilyushin Il-86	Boeing 767, 787 Airbus A300, A310, A330-200 Airbus A350-800 Boeing/MDC DC-10 Lockheed L-1011 Ilyushin Il-96

Source: Boeing Current Market Outlook 2007


Exhibit 12 The Commission's Directorates-General, Services and Other Relevant Bodies

DGI	External Relations: Commercial Policy and Relations with North America, the Far East, Australia and New Zealand
DGIA	External relations: Europe and the New Independent States, Common Foreign and Security Policy and External Missions
DGIB	External Relations: Southern Mediterranean, Middle and Near East,

	Latin America, South and South-east Asia and North-South Cooperation
DGII	Economic and Financial Affairs
DGIII	Industry
DGIV	<u>Competition</u>
DGV	Employment, Industrial Relations and Social Affairs
DGVI	Agriculture
DGVII	Transport
DGVIII	Development
DGIX	Personnel and Administration
DGX	Information, Communication, Culture, Audio-visual
DGXI	Environment, Nuclear Safety and Civil Protection
DGXII	Science, Research and Development
DGXIII	Telecommunications, Information, Market and Exploitation of Research
DGXIV	Fisheries
DGXV	Internal Market and Financial Services
DGXVI	Regional Policies and Cohesion
DGXVII	Energy
DGXIX	Budgets
DGXX	Financial Control
DGXXI	Customs and Indirect Taxation
DGXXII	Education, Training and Youth
DGXXIII	Enterprise Policy, Distributive Trades, Tourism and Cooperatives
DGXXIV	Consumer Policy and Consumer Health Protection
	Secretariat-General of the Commission
	Inspector General
	Legal Service
	Spokesman's Service
	Joint Interpreting and conference Service
	Statistical Officer
	Translation Service
	Joint Research Centre
	European Community Humanitarian Office (ECHO)
	Euratom Supply Agency
	Office for Official Publication of the European Communities

Source: Cini and McGowan (1998) p46 Note: DGXVIII was disbanded in 1996.

Exhibit 13 Objectives Associated With Competition Policies

Consumer Welfare 	This is a technical function of competition policy which assumes a direct and formal relationship between the promotion of
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	competition and improved economic performance.
<i>Protection of the Consumer</i>	This Involves the defence of the individual against big business, usually for moral or political reasons.
<i>Redistribution of Wealth</i>	This is an attempt to inhibit a small number of firms from accumulating a large amount of wealth, an inherently political objective which implies that monopolies and cartels are undemocratic.
<i>Protection of Small and Medium-Sized Enterprises</i>	This does not just imply the protection of infant industries, but also assumes that a large number of small firms in a market are in itself a good thing.
<i>Regional, social and Industrial Considerations</i>	These reflect the frequent use of competition policy as an instrument working for non-competition policy ends, such as the development of regions in decline, the reduction of unemployment or the attainment of a global presence in a particular sector.
<i>Market Integration</i>	This is a particularly European phenomenon in which competition policy is used to break down privately constructed barriers to trade between the EU member states, thus contributing to the creation of a Single European Market (SEM).

Source: The table constructed based on Cini and McGowan (1998) page 4

Exhibit 14 Article 85[81] of the EEC Treaty on European Union

1. The following shall be prohibited as incompatible with the common market: all agreements between undertakings, decisions by associations of undertakings and concerted practices which may affect trade between Member States and which have as their object or effect the prevention, restriction or distortion of competition within the common market, and in particular those which:

- (a) directly or indirectly fix purchase or selling prices or any other trading conditions;
- (b) limit or control production, markets, technical development, or investment;
- (c) share markets or sources of supply;
- (d) apply dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage;

(e) make the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which by their nature or according to commercial usage, have no connection with the subject of such contracts.

2. Any agreements or decisions prohibited pursuant to this Article shall be automatically void.

3. The provisions of paragraph 1 may, however, be declared inapplicable in the case of:

- any agreement or category of agreement between undertakings;
- any decision or category of decisions by associations of undertakings;
- any concerted practice or category of concerted practices;

which contributes to improving the production or distribution of goods or promoting technical or economic progress while allowing consumers a fair share of the resulting benefit and which does not:

- (a) impose on the undertaking concerted restrictions which are not indispensable to the attainment of these objectives;
- (b) afford such undertakings the possibility of eliminating competition in respect of a substantial part of the products in question.

Source: Cini and McGowan (1998) p61

Exhibit 15 Article 86[82] of the EEC Treaty

Any abuse by one or more undertakings of a dominant position within the Common market or in a substantial part of it shall be prohibited as incompatible with the common market in so far as it may affect trade between Member States.

Such abuse may, in particular, consist in:

- (a) directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions;
- (b) limiting production, markets or technical development to the prejudice of consumers;
- (c) applying dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage;
- (d) making the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts.

Source: Cini and McGowan (1998) p82

END NOTES

¹ State-business relationships are based on the concept developed by Susan Strange (1988).

² Major consortium states of Airbus include France, Germany, and the UK.

³ Source: Hall, Peter A. and Soskice, David. (2001). Varieties of Capitalism. "Varieties of Capitalism: The Institutional Foundations of Comparative Advantage"

⁴ Source: www.euractiv.com "EU claims US aid to Boeing cost Airbus \$27 billion." Article #167126.

⁵ Major consortium (international business agreement) states of Airbus: France, Germany and the UK.

⁶ Source: Airbus gets government subsidies in the form of EU government loan at a below market rate (based on a documentary proof from Airbus) claimed by Mr. Charlie Miller, Director of Communications, Europe, International & Sales Communications of the Boeing Company during my interview visit with him in his office in London in October 2009.

⁷ Petersmann and Pollack, 2005, p3

⁸ Source: Strange, Susan (1988). "States and Markets" (p11-12). According to Strange (1988), the theory is defined as "a supposition explaining something, especially based on principles independent of phenomenon to be explained. Strange argues that three positive assumptions are: first, assumption theory must seek to explain some aspect of the international system that is not easily explained by common sense. Second, theory need not necessarily aspire to predict or to prescribe. Thirdly, theory should be scientific only in the sense that the theorist respects the scientific virtues of rationality and impartiality and aspires to the systematic formulation of explanatory propositions.

⁹ Major consortium states of Airbus: France, Germany and UK.

¹⁰ Grant 2000, Wilson 1990, Vogel 1989 as cited in Coen and Grant, 2006.

¹¹ Airbus is consisted of three major EU member states with 38% stake each for the Germans and French, 20% for the British, and one minor EU member state with 4% for the Spanish.

¹² Vernon, Raymond (1974, pp11-12, 17-23). 'Big Business and the State: Changing Relations in Western Europe'. 'In 1974, Raymond Vernon, McArthur and Scott followed up a study of US multinational corporations by editing a study of the relations between big firms and governments in Europe. 1974 (as cited in Hayward, 1995, p5).

¹³ as cited in Hall and Soskice, 2001, p2.

¹⁴ as cited in Hall and Soskice, 2001, *ibid*.

¹⁵ *Ibid*.

¹⁶ as cited in Hall and Soskice, 2001, p3.

¹⁷ as cited in Hall and Soskice, 2001, *ibid*.

¹⁸ as cited in Hall and Soskice, 2001, *ibid*.

¹⁹ as cited in Hall and Soskice, 2001, *ibid*.

²⁰ as cited in Hall and Soskice, 2001, *ibid*.

²¹ Piore and Sabel 1984; Dore 1986; Streeck and Schmitter 1986; Dosi et al. 1988; Boyer 1990; Lazonick 1991; Campbell et al. 1991; Nelson 1993; Hollingsworth et al. 1994; Herrigel 1996; Hollingsworth and Boyer 1997; Edquist 1997; Whitney 1999) as cited in Hall and Soskice, 2001, *ibid*.

²² A technological or organizational leader (Hall and Soskice, 2001).

²³ Hall and Soskice, 2001.

²⁴ *Ibid*.

²⁵ *Ibid*.

²⁶ Hall and Soskice, 2001, pp4-5.

²⁷ Industrial policy-makers and trade union leaders often have such powers (Hall and Soskice, 2001, p5).

²⁸ As cited in Scharpf (1997a, p60).

²⁹ Hall and Soskice, 2001, p6.

³⁰ *Ibid*.

³¹ *Ibid*.

³² Source: Hall and Soskice (2001), p6-7.

³³ As cited in Hall and Soskice, 2001, p6.

³⁴ "Conversely, two institutions can be said to be 'sustainable' if the absence or in efficiency of one increases the returns to using the other. Note that we refer to total returns, leaving aside the question of to whom they accrue, which is a matter of property rights, and we define efficiency as the net returns to the use of an institution given its cost." as cited in Hall and Soskice, 2001, p17.

³⁵ Mergers and acquisitions, even hostile takeovers become a prospect when the market valuation of a firm declines. Securing finance by large firms depend on their valuation in equity markets, where dispersed investors depend on publicly available information to value the company. (Hall and Soskice, 2001, p27).

³⁶ As a result, EADS replaced Forgeard, French co-CEO of EADS and Humbert, Airbus chief. Tom Enders and Louis Gallois were named as the German and French co-CEOs of EADS and Christian Streiff (German) as Airbus CEO. Indirect contrast to Airbus management shuffles influenced by the French and German

governments, two Boeing CEOs were recently forced to resign (due to their misconducts) by the Board of Directors.

³⁷ Hall and Soskice, 2001, pp22-26.

³⁸ In short, firms sit inside dense business networks from which potential funders can gain inside information about a firm.

³⁹ 'compared to general skills that can be used in many settings, industry-specific skills normally have value only when used within a single industry and firm-specific skills only in employment within that firm.

⁴⁰ This section draws from 'Britain: The Spectator State' by Grant, 1995, pp76-83 in Hayward, 1995.

⁴¹ Wilson, Graham as cited in Coen and Grant, 2006. p34.

⁴² Grant in Hayward (1995, p76)

⁴³ Grant in Hayward (1995, *ibid*)

⁴⁴ Grant in Hayward (1995, *ibid*)

⁴⁵ Hart, Jeffrey, in "British Industrial Policy" as cited in Barfield and Schambra (1986, p128)

⁴⁶ Grant in Hayward (1995, *ibid*)

⁴⁷ Grant in Hayward (1995, *ibid*)

⁴⁸ Grant in Hayward (1995, p77)

⁴⁹ Grant in Hayward (1995, *ibid*)

⁵⁰ Other relevant disciplines include economics, economic history, business history, organization theory, and business studies (Grant 1995, p79).

⁵¹ McGuire and Smith (2008).

⁵² *Ibid*.

⁵³ Source: Strange, Susan (1992) "States, Firms and Diplomacy" *International Affairs* (Royal Institute of International Affairs 1944-). Vol. 68, No.1. (Jan., 1992), pp. 1-15.

⁵⁴ *Ibid*.

⁵⁵ Hayward, 1995 p160

⁵⁶ Hayward, 1995, *ibid*.

⁵⁷ Hayward, 1995, *ibid*.

⁵⁸ As cited in Hayward, 1995, *ibid*.

⁵⁹ Muller, Pierre (1995) as cited in Hayward, 1995, p158.

⁶⁰ As cited in Hayward, 1995, *ibid*.

⁶¹ This section draws from Hayward, 1995, pp161-164.

⁶² Concorde, the first intra-Europe commercial jet project, was the world's first and the only commercial supersonic passenger airplane financed by British and French governments. It was developed in the 1960s by British and French aerospace engineers. However, as the fuel price escalated in the mid-1970s, the fuel-guzzling Concorde was not a commercially viable project. The original Concorde project was to build 300 airplanes but only 20 airplanes were built. The British and French government eventually wrote off the cost of Concorde and practically gave away the airplanes to British Airways and Air France. The demise of the Concorde operation followed soon after its fatal crash.

⁶³ As cited in Hall and Soskice, 2001, p6.

⁶⁴ As cited in Scharpf (1997a, p60).

⁶⁵ The concept of the 'agent-structure' is based on 'Critical Theory' (Stearns and Pettiford, 2001 p106).

⁶⁶ The definitions of the terminologies(e.g. monopoly, duopoly,etc.) are based on "Economics" co-authored by Krugman, Paul, Robin (2008).

⁶⁷ Source: "Economics" by Keugman, Paul, Robin, 2008 p364) "When no one firm has monopoly, but producers nonetheless realize that they can affect market prices, an industry is characterized by **imperfect competition**."

⁶⁸ *Ibid*.

⁶⁹ *Ibid*.

⁷⁰ *Ibid*.

⁷¹ Concepts and theories drawn from "Economics" co-authored by Krugman, Paul and Wells, Robin (2008)

⁷² *Ibid*.

⁷³ *Ibid*.

⁷⁴ Source: www.boeing.com/history/narrative/n036boe.html

⁷⁵ Airbus A320 introduced pilot commands through a side stick controller instead of the traditional control column. Flight-control computers translate these commands into electrical signals for the moving surface actuators. Compared to the traditional mechanical flight controls, this brought increased maneuverability, simplified operations through digital link-up with the autopilot system and weight reduction. The fly-by-wire concept is now featured on all a320 Family aircraft as well as the A330/A340 Family. Airbus competitors did not introduce fly-by-wire controls for civil aircraft until later (Source: Airbus).

⁷⁶ Source: Airbus – Information on EADS Activities.

⁷⁷ While Airbus and Boeing continued increasing their marketing strength with a full range of airplanes (with various flight range and seat capacity) and developing new airplane models, Douglas became a marginal player because of its limited financial resources. On one hand, Douglas was basically selling only two product lines: the wide-body DC-10 tri-jets (later developed into the tri-jet MD-10 and MD-11) and short-range, one-aisle

standard-body DC-9 airplanes. And the Douglas wide-body tri-jets were getting obsolete and replaced by more fuel-efficient wide-body twin-jets such as Boeing B767 and B777 and Airbus A310. On the other hand, both Airbus and Boeing with a great deal of corporate resources were able to develop a full product line of airplanes with various flight range and passenger payload capabilities. Both Airbus and Boeing produce short-, medium-range to long-range airplanes to meet various passenger traffic demands from small, medium to high density traffic segments.

By early 1990s Douglas was seriously looking for a possible partnership to become more competitive in order to keep up with Airbus and Boeing in competitive large commercial airplane business. However, Douglas's desperate search for a partnership company went in vain. Boeing was looking for a company like McDonnell which is fully engaged in a US defense business and would help Boeing stabilize the business fluctuation inherent in a large commercial airplane business. Boeing eventually captured the US defense business opportunities by merging with McDonnell-Douglas in 1997. The US large commercial airplane industry was finally consolidated into the Boeing Company, which became the one and the only American company with the large commercial airplane business, military airplane business, and the US defense business.

⁷⁹MDC seemed to have destined to follow the eventual demise of Lockheed's tri-jet L10-11 unless MDC turns its business around and quickly catch up with Airbus and Boeing. Therefore, McDonnell Douglas had been seeking a prospective partnership company.

MDC needed to develop competitive airplanes, hopefully a full product line comparable to those of Airbus and Boeing. Given the most competitive commercial airplane business environment, MDC seemed to have the only one option to stay in business, which was to come up with the most competitive and efficient airplane. However, to develop a new airplane model will require billions of dollars of R&D funding, so-called 'launch' money, either internally or externally. Against this background, MDC did exactly that, desperately seeking the internal and external source of funding in order to develop the new airplane program, the MD-12X. However, MDC critically needed the external funding which is estimated to be around \$4.5 billion for the undertaking of the MD-12X to compete with Airbus and Boeing. Phil Condit, Boeing's CEO began a dialog with McDonnell Douglas to look into a merger possibility of Boeing and McDonnell Douglas. The merger talk went on for next few years until Douglas faced the two major setbacks in 1996. The first setback of Douglas was the cancellation of Douglas' plans on the MD-12, a new 600-passenger super jumbo. Somehow both Douglas and Airbus got the same idea about building the super jumbo 600-passenger airplanes. Douglas's second setback was its failure to join Lockheed and Boeing for the F-35 JSF (Joint Strike Fight) program. McDonnell Douglas' desperate search for partnership went in vain. Consequently, Douglas had no other option but to merge with Boeing.

⁷⁹ Fox (1998) as cited in Stock (1999), p825.

⁸⁰ Source: www.ustr.gov

⁸¹ Source: WTO. Drawn from "Understanding the WTO: Settling Disputes: A Unique Contribution." www.wto.org

⁸² Source: WTO. Drawn from "Understanding the WTO: Settling Disputes: A Unique Contribution." www.wto.org

⁸³ Boeing Frontiers online dated February 2005, Volume 03, Issue 9.Ibid. Quoted by Richard Mills, spokesman for US Trade Representative Robert Zoellick. Basically Airbus and Boeing agreed to develop and secure a comprehensive new agreement to end airplane subsidies. The US made it clear that the objective on which the both sides agreed upon was to "secure a comprehensive agreement to end subsidies"

⁸⁴ Boeing Frontiers online dated February 2005, Volume 03, Issue 9.Ibid. Commented by Ted Austell, Boeing vice president for trade and policy. Boeing Frontiers online dated February 2005, Volume 03, Issue 9.

⁸⁵ Hocking and McGuire, 2004. p285.

⁸⁶ Michaels, 2004b, WSJE.

⁸⁷ The Economist, 1997, ibid.

⁸⁸ Source: Airbus (Information on EADS Activities: 1.1.2 Airbus, page 15 – 17.

⁸⁹ Boeing Current Market Outlook, 2007. p16-19. During the twenty-year period from 2006 to 2026, Boeing projected that the world economy in terms of GDP would grow at 3.1 percent annually, and airline traffic at 5.0 percent annually in terms of revenue passenger-kilometers (RPK). However, the Boeing projection, which was developed in 2007, had not taken into account the current severe financial crisis and associated economic downturn. A severe economic depression would make the on-going subsidy dispute even worse given that Airbus and Boeing will be sharing a much smaller, down-scaled market demand for airplanes affected by the worst economic prospect. Earlier in 2004, Airbus projected that passenger air travel would grow at 5.3 percent annually during the 20-year period from 2004 to 2024. Prior to the current financial meltdown, the consensus of the 20-year projected growth of passenger air travel was in the range of 5.0 percent to 5.3 percent annually estimated by Airbus and Boeing in 2007. This did not take account of the current severe financial crisis, a negative impact of the high oil price, and concerns about the negative effect of air travel on climate change.

⁹⁰ The market for large commercial airplane is largely dependent on the demand for airline passenger worldwide travels, which is driven by gross domestic product (GDP) growth, passenger fare levels, and demographic growth. The GDP being the most important variable for projecting the passenger air travel, the econometric models developed by Boeing confirms that demand for air travel hence, the airlines' increasing demand for commercial airplanes, is highly correlated to economic growth measured as GDP.

⁹¹ These 28,600 new airplanes from 2007 to 2026 projected by Boeing will be bringing higher efficiency, improved comfort, and increased capabilities - better for the environment, passengers, and airlines than most of

the airplanes in service today. The airline fleet will be almost completely revitalized over the next twenty years. In the year 2026, 80 percent of the fleet will be airplanes that have been delivered new since 2006. However, Boeing's projection did not warrant justification of two "new generation" airplane models of the 747 sized or larger airplanes competing against each other in the large-sized airplane market segment. Therefore, Boeing opted for development of the medium-sized "new generation" 787 with 223-296 seat capacity to capture much larger market segment of intermediate-sized airplane marketplace based on a "direct, non-stop" point-to-point service concept. The 787 is scheduled for delivery in 2009. And as the air travel expands four years later in 2013, the 787-10 with 320 seats, which will be the largest 787 derivative model, is set to launch.

Demand for large commercial airplanes is affected by regulation and deregulation of air travel markets. The United States implemented the deregulation of its domestic air transportation system in 1978. Europe and other regions have followed the US model since 1985. Implementation of deregulation policies allowed major airlines to constantly adapt their airplane fleets, network, and marketing strategies to the changing business environment. This adaptation made the airline network development possible because of the availability of modern airplanes that best meet airline customer requirements in terms of cost and performance.

FAA (Federal Aviation Agency) Stage 3 anti-noise regulations required the replacement of many numbers of old airplanes by the end of 1999. The regulations impacted demand for new airplanes, resulting in significantly increased orders from airlines serving North American air travel markets to meet the FAA regulations.

⁹² Source: Airbus' Global Market Forecast 2004-2024.

⁹³ The airlines decide the passenger seat configuration of the airplane as to the ratio of how many first class and economy class passengers to be carried on the particular route segment.

⁹⁴ The degree to which successive generations of technology in the large commercial airplane industry will make early versions of the airplane model obsolete varies. Some airlines can get all the benefits they really need from the earlier generation, whereas other airlines will be pressed to acquire successive generations of new airplane model to remain competitive. Successful airlines may be more or less willing to replace the old fleet of airplanes earlier than the cash poor airlines. Financially cash poor airlines may be more or less willing to postpone the purchase of new model airplanes and continue operating the old fleet, thus losing a competitive edge. (Source: The concept of the "cost of obsolescence" is drawn from page 228 of 1998 "Competitive Strategy," by Michael E Porter).

⁹⁵ The term "airframe" is an airplane without engines. Airbus and Boeing are technically airframe manufacturers. Therefore, Harvard case study opts to call this industry an "airframe" industry instead of "airplane" industry, which is a commonly used name. However, the proper name of the industry should remain to be the airplane industry simply because the name "airframe" industry is rarely used in the industry or anywhere else with the exception of Harvard case study.

⁹⁶ Boeing makes a full range of large commercial airplanes from the B737 with about 100 seats to the 747 with about 400 seats depending on the configuration of airplanes. Airbus also builds a full line of commercial airplanes, the largest of which is the double deck super jumbo A380 which accommodates 550 to 600 passengers. However, the A380 ran into a series of technical problems that caused two years behind the schedule but finally went into service in late 2008.

⁹⁷ The definition and the marketing concept of "product differentiation" are drawn from "Economics" by Krugman, Paul and Wells, Robin (2006). Worth Publishers.

⁹⁸ Time magazine, January 9, 2012.

⁹⁹ "Management Theory and Practice" by Cole, G.A. (2004) Sixth Edition. Thompson.

¹⁰⁰ Source: Kotler and Armstrong (2010). P216.

¹⁰¹ Ibid.

¹⁰² Source: Kotler and Armstrong (2010). P220.

¹⁰³ A good which is priced low, possibly even below cost, to attract customers who are expected to buy goods which yields a profit.

¹⁰⁴ However, airlines' airplane acquisition decision is not always based on an economic decision. Especially the national carriers owned by the government or the airlines with substantial government equity make a buying decision not always based on the economic viability of the airplanes but based on the political decisions heavily influenced by the governmental politics.

¹⁰⁵ Source: Airbus – Information on EADS Activities. 1.1.2 Airbus

¹⁰⁶ Source: Airbus – Information on EADS Activities. 1.1.2 Airbus

¹⁰⁷ Source: Airbus – Information on EADS Activities. 1.1.2 Airbus

¹⁰⁸ Source: Airbus – Information on EADS Activities. 1.1.2 Airbus

¹⁰⁹ Source: Airbus – Information on EADS Activities. 1.1.2 Airbus

¹¹⁰ Source: Airbus – Information on EADS Activities. 1.1.2 Airbus

¹¹¹ Source: Airbus – Information on EADS Activities. 1.1.2 Airbus, page 15-17.

¹¹² WSJE, 25/09/2007.

¹¹³ Ibid.

¹¹⁴ An airframe manufacturer and the key potential airline customers start working together to come up with the definition of the particular airplane models, design of the models, airplane specifications, and then a proto type model.

¹¹⁵ Ibid.

¹¹⁶ Sandholtz and Love (2001). WSJE 25/09/2007. WSJE 15/10/2007.

¹¹⁷ Source: Newhouse, John (2007). Chinese manufacturers are making a wide range of wing components for Airbus airplanes including the leading and trailing edges of the A320's wing and landing gears.

¹¹⁸ Three heavies: Kawasaki Heavy Industries Company, Mitsubishi Heavy Industries Company, and Ishikawajima-Harima Heavy Industries Company.

¹¹⁹ Source: Robbins, Stephen P. and Coulter, Mary. "Management" 2003 Update. Pages 208-209.

¹²⁰ Which controls inputs (backward vertical integration), outputs (forward vertical integration), or both. In backward vertical integration, the company attempts to control its inputs by becoming its own supplier. Source: Robbins, Stephen P. and Coulter, Mary. "Management" 2003 Update.

¹²¹ Boeing has been in joint profit/risk sharing joint ventures with three Japanese manufacturers for the last three decades. Boeing's major task is to assemble the major airplane parts shipped in or flown into Boeing's two major assembly plants in Renton (for standard-bodied airplanes) and Everett (for wide-bodied airplanes) in the state of Washington.

¹²² Source: "Boeing Frontiers online. November 2002. Volume 01, issue 07."

"Market shaping" strategy, if it's done right, is about helping a company anticipate customer needs. In turn, the company can invest in the right technology, product or service at the right time. The strategy is to identify and create new markets on the horizon. It is a proactive marketing strategy beyond a traditional approach of 'satisfaction of customer needs at a profit.' "It's about understanding where your customer is going and where they will be in the future," according to Boeing's ex-Chairman and CEO Phil Condit. Boeing and the customer initially work together to better understand market drivers and anticipate where a given market will go, and the capabilities needed 10 to 20 years in the future, Shephard Hill, Boeing's Vice President for Business Development said. Boeing's strategy looked beyond the horizon at future markets and helped pave the customer's way to them.

¹²³ Source: Boeing Frontiers online. November 2002, volume 01, issue 07.

¹²⁴ Source: Hall and Soskice, 2001, p6-7.

¹²⁵ Ibid.

¹²⁶ According to Tom Pickering, Washington-based senior vice president of International Relations for Boeing.

Boeing Frontiers online by Paul Proctor. November 2002. Volume 01, issue 07.

¹²⁷ Up until the early 1970s, Boeing 707 was flown by a crew of five in the cockpit including three pilots, a flight engineer, and a navigator. In the early 1980s, when it became obvious there were real advantages to having just two pilots in the cockpit of commercial airplanes instead of a crew of three pilots, Boeing played a major role on the issue. Today, all new, large commercial airplane cockpits are flown by only two-person crew.

¹²⁸ Boeing established its Air Traffic Management business units in 2000 in order to create an infrastructure that will enable the commercial airplane business to grow in response to market forces and not be infrastructure – constrained, according to John Hayhurst, President of Boeing Air Traffic Management (Boeing Frontiers Online, November 2002, Vol. 01, Issue 07).

¹²⁹ John Hayhurst, president of Boeing Air Traffic Management. (Boeing Frontiers Online, November 2002, Vol. 01, Issue 07).

¹³⁰ However, the A350 strengths seemed to be significant (2004, Wall Street Journal –Europe): (1) Being the replacement airplane for the A330 with a world-wide customer base, the A350 would capture the existing natural customer base of the A330; (2) Airbus could charge airlines less to buy the A350 because Airbus could possibly spend less than Boeing to develop its 787; (3) the A350 could bring savings in its pilot training cost. For example, the A350 could be designed so that any pilot certified to fly the A330 could also fly the A350 without retraining.

¹³¹ according to the printed media Wall Street Journal (2004, Wall Street Journal – Europe):

¹³² Since the mid-1980s, Boeing has recognized and implemented a new way of making things, called lean production, which had its roots in Japanese auto industry. Lean production rapidly made mass production – since Henry Ford's assembly line – completely obsolete. As the Japanese companies swept the world with its lean principles, the industrial world experienced the most revolutionary change.¹³² Boeing was among the first US manufacturers to recognize the lean principles and sent a number of study missions to Japan. The first such mission was spearheaded by Frank Shrontz, then Chairman and the CEO of Boeing at the time. The Japanese lean principles became Boeing's customer-oriented, rigorous manufacturing principles embedded in its corporate culture. Today, under the leadership of Jim McNerney, new Chairman and CEO, Boeing continues carrying out the lean manufacture, productivity gains, and quality through application of lean manufacturing principles – the application of rigorous and disciplined processes. With growth as a robust customer oriented process "begins with listening to the customer and formulating the right concept for sustained and profitable growth that fits the customer's needs."¹³²

That said, Boeing recognizes and continues to set out to achieve significantly improved performance in the intermediate to long term – over the next 5 to 10 years - achieving both accelerated excellent growth and improved margins and cash generation.¹³² Boeing's long-term corporate objectives are typically characterized by other leading American companies of today. They are quite different from typical US companies a few decades ago, champions of near-term success measured by the year-end income statement and balance sheet often at the expense of long-term corporate success. Just like lean principles, long-term corporate objectives rather than short-term ones had its roots in the Japanese management practice of achieving long-term goals instead of seeking the short-term success. Consequently, the US companies including Boeing recognized the value in the long-term success and found ways to emulate the successful Japanese management practice of long-term goals in the late 1980s and the 1990s.

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¹³⁴ Platt, Lewis E., Non-Executive Chairman, The Boeing Company, "Boeing: Moving Ahead" at Boeing Shareholders Meeting, Chicago, Illinois, May 02, 2005.

¹³⁵ Source: The Boeing Company 2007 Annual Report: W. James Mcnerney, Jr., Chairman, President and CEO to the shareholders and employees of the Boeing Company. Boeing's corporate initiatives to accelerate growth and productivity include four initiatives: internal services productivity that focuses on productivity eliminating redundancy, improving efficiency; global sourcing aiming to achieve greater scale economies; lean+ (plus), an on-going application of lean principles; and development process excellence that facilitates increasing the speed and improving the yield of R&D and the major programs such as the 787 and the FCS (Future Combat System) in the Integrated Defense Systems (IDS). By embracing input from other parts of the company – most notably Lean+ (plus) practices from Boeing Commercial Airplanes (BCA), Boeing's satellite business has regained profitability and competitiveness. While Boeing implemented those four initiatives, Boeing also recognized the advantages of a global strategy focused on a three-point transformation strategy: first, transforming and simplifying its product offerings; second, transforming and streamlining its production systems; and, third, transforming Boeing customer relationships to ensure that Boeing is responsive to customers' requirements and deliver innovative solutions tailored to their needs (the Boeing 2007 Annual Report).

¹³⁶ Commercial Airplanes received a 1,002 net (1,029 gross) new commercial airplane orders in 2005, an all-time Boeing record. And its contractual backlog at the end of 2005 reached a record level of over \$160 billion, a 46 percent increase over the previous year. Boeing's strong financial performance in 2005 is reflected by a 36 percent increase in its stock price appreciation over the course of the year.

¹³⁷ Source: Boeing cited in WSJE dated Sept. 17, 2007.

¹³⁸ Source: Boeing cited in WSJE dated Sept. 6, 2007.

¹³⁹ Source: The Boeing Company 2003 Annual Report

¹⁴⁰ Ibid.

¹⁴¹ Source: European Commission's "Update September 2007: The WTO Boeing-Airbus Dispute."

¹⁴² Source: Chandler, Alfred D. p315.

¹⁴³ Over 100 passengers seat capacity up to 400 or more passenger carrying capability like the 747.

¹⁴⁴ The US government generally sticks to its hands-off policy as the former President Bush pre-warned about his administration's policy of not bailing out private American corporations from the economic downturn. In fact, Bush's warning was validated by Boeing's large-scale massive lay-off somewhere in the neighborhood of about 40,000 workers between the late 1960s and early 1970s.

¹⁴⁵ Source: The 1992 GATT agreement between the EU and the US governments.

¹⁴⁶ Cohn, 2003.

¹⁴⁷ Ibid.

¹⁴⁸ Ibid.

¹⁴⁹ This is called "launch aid" which would have to be repaid with interests within 17 years.

¹⁵⁰ Source: Wall Street Journal (WSJE), 26-28, 2004. "Memo to Mandy." "After all, that pact certainly didn't encourage competition in an industry that has seen every other player fall by the wayside."

¹⁵¹ The 1992 GATT agreement allowed the EU governments to continue subsidizing Airbus as if the EU governments were still nurturing their infant industry. After twelve years of legitimate government subsidies under the 1992 pact, Airbus finally succeeded in taking the leadership away from Boeing in 2003.

¹⁵² Source: The Office of the United States Trade Representative. "U.S. Files WTO Case Against EU Over Unfair Airbus Subsidies" dated 6th of October 2004. www.ustr.gov/government

¹⁵³ Ibid.

¹⁵⁴ Boeing Frontiers online. September 2004/2005 Volume 03, issue 08.

¹⁵⁵ Boeing Frontiers online. September 2004/2005 Volume 03, issue 08.

¹⁵⁶ Miller et al (2004) WSJE.

¹⁵⁷ WSJE (2004) "Air Superiority." 8 October 2004.

¹⁵⁸ Miller (2004a) WSJE.

¹⁵⁹ King Jr. (2004) WSJE. In addition, a Boeing analysis concluded that "if Airbus had been required to pay prevailing commercial loan rates available at the time it received the aid, Airbus should have about \$35 billion of debt on its books, rather than the approximately \$5 billion that shows up today." (WSJE 2004, "Airbus appears to trump Boeing." 8 November 2004).

¹⁶⁰ Ibid.

¹⁶¹ Boeing Frontiers online. September 2004/2005 Volume 03, issue 08.

¹⁶² Miller (2004a), Lunford and Michaels (2004). WSJE.

¹⁶³ Ibid.

¹⁶⁴ Meunier, Sophie (2004), in FUSA (European Union Studies Association) Review, Vol. 17, No.2 Spring 2004. pp1-3.

¹⁶⁵ Meunier, Sophie (2004). ibid.

¹⁶⁶ Von Reppert-Bismarck (2004) WSJE.

¹⁶⁷ Von Reppert-Bismarck (2004) WSJE.

¹⁶⁸ WSJE (2004) "Air Superiority." 8 October 2004.

¹⁶⁹ Miller (2004a) WSJE.

¹⁷⁰ Miller (2004a) WSJE.

¹⁷¹ Meunier (2004) p1. In March 2004, it has been decided by the Europeans that the retaliatory measures would be phased in.

¹⁷² Boeing Frontiers online. December 2004/January 2005 Volume 03, issue 08.

¹⁷³ Boeing Frontiers online. December 2004/January 2005 Volume 03, issue 08.

¹⁷⁴ Under the WTO rules, the consultation lasts at least 60 days, or continues as long as necessary and both sides continue making progress.

¹⁷⁵ This agreement became the 1992 EU-US bilateral agreement on large civil aircraft, which was terminated by the US in 2004.

¹⁷⁶ Over the course of the agreement's life time, it turned out that Airbus was the main beneficiary of the agreement that legitimized Airbus' sustained use of launch aid for twelve years up to one-third the cost of launching any new airplane model whenever Airbus needed.

¹⁷⁷ Airbus had to go back to the drawing board in the summer of 2006 due to customer airlines' critical comments and requests to redesign Airbus the A350 model.

¹⁷⁸ EU Trade Commissioner Peter Mandelson and US Trade Representative Robert Zoellick.

¹⁷⁹ Source: Boeing Frontiers on line, Volume 03, Issue 9
www.boeing.com/news/frontiers/archive/20005/February/i_iwl.html

¹⁸⁰ Source: Boeing Frontiers on line, Volume 04, Issue 1.

¹⁸¹ Source: Boeing Frontiers on line, Volume 04, Issue 1.

¹⁸² Source: Boeing Frontiers on line, Volume 04, Issue 1.

¹⁸³ Source: Boeing Frontiers on line, Volume 04, Issue 1.

¹⁸⁴ Source: Boeing Frontiers on line, Volume 04, Issue 1.

¹⁸⁵ The Times of London, 12th of January, 2005 as cited in Boeing Frontiers online dated February 2005, Volume 03, Issue 9.

¹⁸⁶ Covered by a legal provision protecting prior rights from the effect of new law.

¹⁸⁷ Los Angeles Times, April 16, 2005.

¹⁸⁸ Chicago Tribune, April, 2005.

¹⁸⁹ Lawrence (2001) authored "Aerospace Strategic Trade: How the US Subsidizes the Large Commercial Aircraft Industry". Airbus's core arguments seem to be in line with Lawrence's (2001) view on the US subsidization of the large commercial aircraft industry and how NASA transfers its technology to Boeing. Strong arguments were made in favor of Airbus's case over Boeing by European Commission in Brussels during my visit in October 2009. NASA's technology transfer to Boeing is one of the EU's strong arguments against the US's case. Lawrence (2001) remains to be the main theoretical architect of arguments against Boeing.

¹⁹⁰ Based on the visit with Boeing's UK office.

¹⁹¹ Drawn from European Commission's "Update September 2007: The WTO Boeing-Airbus Dispute."

¹⁹² Source: European Commission External Trade – Press Information Service. <http://ec.europa.eu/trade/>

¹⁹³ Former Washington State Governor Gary Locke has said that the Washington state support is designed to help "Boeing beat Airbus" and to "give Airbus executives many sleepless nights for years to come". Former NASA Langley Director J.F. Crendon is on the record as saying that "the reason that there is a NASA Langley and the other aeronautics centers is to contribute technology to assure the pre-eminence of US aeronautics".

¹⁹⁴ Source: European Commission External Trade.

¹⁹⁵ Source: European Commission External Trade.

¹⁹⁶ Other programs include the National Polar-orbiting Operational Environmental Satellite System-Conical Microwave Imager Sensor, the C-22 Replacement Program (C-40), the KC-135 Programmed Depot

Maintenance, the C-40 Lease Purchase program, the C-130 avionics modernization upgrade program, the C-17 H22 contract (Boeing BC-17X), the US Navy contract with Boeing for the production and maintenance of 108 B-737s and their conversion into long-range submarine hunter Multi-mission Aircraft, the Missile Defense Agency's Airborne laser (ABL) program, and the Army's Comanche program.

¹⁹⁷ Source: Lawrence (2001).

¹⁹⁸ The US complaints submitted to the WTO are detailed in its 399 page major documents titled "United States – Measures Affecting Trade in Large Civil Aircraft (second complaint) (DS353) dated July 13, 2007.

¹⁹⁹ Source: United States DS353 (2007a), page 1 in fn. (footnote) 2 quoted: "It is difficult to understand how the EC considered that its actions were consistent with the requirement in Article 3.10 of the DSU that complaints and counter-complaints in regard to distinct matters are not to be linked."

²⁰⁰ Source: United States DS353 (2007b).

²⁰¹ Source: United States DS353 (2007a) page 1. October 4, 2004 report in Bloomberg "Boeing, Airbus Aid May Violate Trade Rules, EU Says" quoting from an EC memo.

²⁰² Source: Boeing. Drawn from a Boeing two-page summary of the USTR's rebuttal of the EC's allegations against Boeing. And also drawn from US DS353 (2007b) United States - Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353) dated 9/26/2007. para. 5 to 13.

²⁰³ Source: US DS353, 2007b. United States - Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353). Non-BCI version of the first written submission of the United States, July 13, 2007.

²⁰⁴ Source: US DS353, 2007b. United States - Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353). Page 2.

²⁰⁵ Source: Boeing fact sheet (2007). A Boeing two-page summary of the USTR's rebuttal of the EC's allegations against Boeing.

²⁰⁶ Source: United States DS353 (2007b). Page 2.

²⁰⁷ Source: US DS353, 2007b. United States - Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353). Page 3.

²⁰⁸ Source: US DS353, 2007b. United States - Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353). Ibid.

²⁰⁹ Source: United States DS353 (2007b) page 2.

²¹⁰ Luis M. B. Cabral, *Impact of Development Subsidies Granted to Boeing*, New York University and CEPR (March 2007).

²¹¹ Source: United States DS353 (2007b) Ibid.

²¹² Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353). The U.S. rebuttal of the EU's allegations is drawn from "Oral Statement of the United States at the First Substantive Meeting of the Panel with the Parties on September 26, 2007.

²¹³ Source: Boeing fact sheet (2007). Ibid.

²¹⁴ Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353), page 3. para. 15 and page 4. para. 16.

²¹⁵ Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353), page 10 - 11. para. 43 – 53.

²¹⁶ Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353), page 10 - 11. para. 46 – 53.

²¹⁷ Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353), page 10 - 11. para. 45 – 53.

²¹⁸ "That right extends to the use of that invention by any other contractor in furtherance of work for the government. DoD also obtains data rights, which again may include the right to convey data developed under the contract to other contractors." Source: United States DS353 (2007b) page 10-11. para. 48.

²¹⁹ Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353), page 4. para. 17, 18, 19, & 20.

²²⁰ Newhouse (2007).

²²¹ Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353). Page 4. para.19.

²²² Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353). Page 5. para.20.

²²³ Bill Wilshire has had a 30-year public service career at NASA, roughly 16 years as a researcher, 10 years leading NASA's aircraft noise reduction projects, and the remainder helping to lead project management organizations.

²²⁴ Source: United States DS353 (2007b) page 12-15, para. 55-67

²²⁵ Source: United States DS353 (2007b) page 12, para. 56.

²²⁶ The Space act also instructs NASA's Administrator to provide for the widest practicable and appropriate dissemination of information concerning its activities and the result thereof. Space Act, 102(d)(1)and (7); 42 U.S.C. 2451(d)(1) and (7) (Exhibit EC-286) as cited in the United States DS353 (2007b). p12, para. 56.

²²⁷ Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (DS353), Page 14, para. 63.

²²⁸ Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353), Page 5 & 6, para. 23, 24, & 25.

²²⁹ Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353), Page 5, para. 21 & 22.

²³⁰ Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353), Page 6. para. 26.

²³¹ Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353), Page 6. para. 27, 28, 29, & 30.

²³² Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353), Page 7. para. 31.

²³³ Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353), Page 7. para. 32 & 33.

²³⁴ Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353), Page 8. para. 34.

²³⁵ Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353), Page 8. para. 35.

²³⁶ Source: United States DS353 (2007b). "United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353), Page 8. para. 36 to 42.

²³⁷ www.euractive.com Article #167126 dated 27 September 2007, "EU claims U.S. aid to Boeing cost Airbus \$27 billion."

²³⁸ Source: Chicago Tribune dated September 5, 2009

²³⁹ Alan Greenspan, a legendary ex-Chairman of Federal Reserve System (the US system of central banking) used to fine-tune the US economy. He focused on controlling money supply by effective methods of monetary policy that included adjustment of the interest rate charged by the central bank in order to control the money supply, prevent inflation, and stabilize the economy.

²⁴⁰ The phrase "assured" embarrassment came from Airbus.

²⁴¹ Long distance flight such as New York - Hong Kong route flying directly without any fuel stops or technical stops.

²⁴² Regional and Sectoral Varieties of Capitalism (Economy Society Volume 38 4 November 2009: 654-678 by Colin Crouch, Martin Schroder and Helmut Voelzkow. Economy and Society Volume 38 Number 4 November 2009: 654-678.

²⁴³ "Regional and sectoral varieties of capitalism" by Crouch, Colin, Schroder, Martin, and Voelzkow, Helmut. Economy and Society Volume 38 Number 4, November 2009: 654-678.

²⁴⁴ Trade associations which are often bypassed by large firms and are not discussed in this thesis.

²⁴⁵ The concept of varieties of capitalism is based on Hall and Soskice's writing, "Varieties of Capitalism" (2001).

²⁴⁶ One of Colin Couch's article titled "Regional and Sectoral Varieties of Capitalism" co-authored with Martin Schroder and Helmut Voelkow was written from the perspective of his recent research on varieties of capitalism theory (Hall & Soskice, 2001).

²⁴⁷ Source: Varieties of capitalism (Hall & Soskice).

²⁴⁸ Remarks by peter J Katzenstein, Walter S. Carpenter, Jr. professor of International Studies at Cornell universities.

²⁴⁹ A launch customer or a take-off customer is the first customer who makes a commitment to purchase a minimum of 30 to 40 airplanes at the pre-launching stage of the new airplane program. An airframe manufacturer decides when to launch a new airplane program based on the intent to purchase a certain number of airplanes by the launch customer to warrant justification to go ahead with a new airplane program, subject to the approval of the manufacturer's board of directors.

²⁵⁰ As of July, 2007.

²⁵¹ A private enterprise with not much governmental intervention or interference in a market economy in the past except for the Federal Reserves' monetary policy of adjusting interest rates as a means to prevent inflation or depression.

²⁵² For example, in early 1992, Frank Schrontz, then Boeing CEO told Clinton during the meeting about Airbus subsidies that matching government subsidies was not the right solution and that Boeing was opposed to government subsidies. Boeing still had a sixty percent market share at the time and Airbus was only sharing 30 percent so this was not a pressing problem to Boeing. But over the next eleven years, Airbus was steadily closing the gap to achieve market share parity with Boeing.

²⁵³ According to Boeing, one of the innovations of the B787 includes enhancement of passenger cabin comfort level. This was achieved by providing a level of oxygen in the passenger cabin much closer to the ground level especially during the high altitude cruising at 40,000 feet above sea level.

²⁵⁴ Boeing confirms the direct flight concept. Boeing's "new generation" airplane B787 is being developed under this concept. The B787 is scheduled for service in 2012.

²⁵⁵ Kemp, Kenny (2006) page 12.

²⁵⁶ Level playing field denotes a fair and free competition without governmental subsidies.

²⁵⁷ Boeing in-house attorneys include a former U.S. judge who was a possible appointee for the U.S. Supreme Court during the current Bush administration.

²⁵⁸ The 7J7 joint program with the Japanese is a case in point. The 7J7, primarily due to the technical complexity of the airplane, never got off ground, so the Japanese government absorbed most of the financial loss of the failed 7J7 program. On the marketing front, the joint risk-sharing venture with the Japanese helped Boeing capture the major share of the lucrative large commercial airplane market in Japan. In fact, Boeing has an almost exclusively dominant share in the Japanese commercial airplane market. All Nippon Airways (ANA) is the so-called "launch customer," the first major Boeing customer that enabled Boeing to begin the building of the B787 airplanes.

²⁵⁹ Including an ex-U.S. judge, who just recently came aboard to join Boeing's legal department. He was a possible candidate for the U.S. Supreme Court judge.

²⁶⁰ Airbus had to go back to the drawing board in the summer of 2006 due to customer airlines' critical comments and requests to redesign Airbus the A350 model.

²⁶¹ Keohane, 1991, p99. "The Theory of Hegemonic Stability and Changes in International Economic Regimes, 1967-1977". This work by Robert Keohane is often cited by scholars "because it offers a clear explanation of the tenets and assumptions of the theory."

²⁶² Source: Statement by the United States at the June 1, 2011 DSB meeting.

²⁶³ Statement by the United States at the June 1, 2011 DSB meeting.

²⁶⁴ Ibid.

²⁶⁵ Ibid.

²⁶⁶ For example, the government of the German city of Hamburg paid approximately 750 million Euros to drain a wetland next to Airbus factory and then charged Airbus below-market rent for use of that land to produce the A380.

²⁶⁷ Statement by the United States at the June 1, 2011 DSB meeting.

²⁶⁸ Provided under Article 7.9 of the Subsidies and Countervailing Measures Agreement. After the lengthy legal proceedings, the Panel and Appellate Body at the WTO concluded that, without launch aid, Airbus and its family of airplanes would not have existed today.

²⁶⁹ In which case, Boeing would have been in a monopoly position with only one seller in large commercial airplane industry. By definition, monopoly, without competition in the marketplace, may lead to inefficient use of resources at the expense of consumers, in this case at the expenses of commercial airlines.